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Original ARTICLES

MEGACOLON

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Phoenix, Arizona

Megacolon, according to Hirschsprung, is a condition of congenital high-grade dilataion of the colon with thickening of all its tunics, especially the tunica muscularis, with the retention of large quantities of fecal matter To this should be added the definition of Claude Dixon who describes the condition as a dilatation and hypertrophy of the colon in the absence of a gross obstructing lesion. This can be discounted many cases mistakenly classed in an already complicated symptom complex which are due to such definitely obstructing lesions as tumors, bands, strictures, adhesions, stenosis or imperforate anus.

Fortunately the condition is rare, occuring once in about every 10,000 hospital admissions and one in every 11,000 autopsies. The earliest was found in a seven month foetus. Males predominate five to one. Genetically there are seven reported instances of it occuring more than once in a family of which one family had four sons with megacolon. Symptoms are dilation of the colon in whole or in part, visible peristalsis, obstipation, emaciation, weakness, atonic skeletal musculature, flared ribs and retardation of secondary sex characteristics in those who reach puberty. The almost obstructing constipation seldom of itself causes vomiting though these patients sometimes go three to four months without a bowel movement.

The etiology is obscure as reports of associated conditions, will show. These include many cases of myxedema, tumors of the hypophysis, 30% of all cases of acromegaly, B_1 avitaminosis and malnutrition (however this may be a result rather than a cause), post-encephalitis, infantilism, mongolism, hydrocephalus, and Pott's disease. Beyond these the condition is not infrequently associated with megaesophagus and/or a dilated atonic bladder but in the majority of cases the infant or patient is normal except for the singular colon abnormality.

The major efforts in the earlier literature were directed toward symptomatic relief except in surgical emergencies; where obstruction due to volvulus or impaction occurred, peritonitis followed perforation from gangrene or ulceration, or pulmonary or cardiac embarrassment from the excessive distention demanded deflation by cecostomy or colostomy. In 1930 the literature was reviewed for cases of resection which were in the main emergency measures for volvulus and only 74 were found. In most cases a Mickulicz double-barrelled colostomy was performed and the mortality was 24.5%.

A great impetus to the study of classification, etiology and therapy was awakened in 1927 when Royle and Wade of Australia published a report of a cure of obstinate obstipation when doing lumbar sympathectomy for spastic paralysis of the lower extremities. This opened up a new field of therapy for this dread condition as well as pointing toward the possible cause. Numerous theories arose, the predominent being that there is in megacolon an imbalance of the nerve supply to the bowel with the sympathetic, which contracts the anal sphincter, overbalancing the parasympathetics which produce contraction of the bowel muscle. Many operations were

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devised which had as their purpose to remove emperically this imbalance mainly by interrupting the sympathetic fibers to the affected portion of the colon. More of this will be discussed under therapy.

Pathologically about 34% have changes only in the sigmoid colon. Sometimes the right colon alone is affected and any portion or all the colon including the rectum may be involved. The wall is like thick wet leather, haustra are absent, the mesentery is elongated as well as the colon itself especially in the sigmoid predisposing to volvulus. There is an increase in fibrous tissue throughout, chronic inflammatory reaction, chronic lymph stasis with enlarged mesenteric nodes in some cases. The muscle layers are hypertrophied until the process progresses to a point where the gut wall becomes atonic and muscle is replaced by fibrous tissue. Many report an agenesis or fibrous replacement of Auerbach's plexus of the intrinsic myenteric nerves and ganglia, some of whom base the rationale of their therapy on this finding, but it is not a consistent pathological change, is not always in the anticipated portion of the colon if found and certain results seem to deny this as the etiological basis. So there is a complex varying problem which some authors consider functional rather than organic and others feel should be considered as a syndrome rather than a disease.

Case 1. F. C. No. 95344 Lincoln Hospital, N. Y. C.

This patient, a 21 year old colored female, was admitted as a surgical emergency on the evening of Dec. 2, 1939. Her chief complaint was pain in the abdomen for 12 hours with distention. The pain was mainly in the left lower quadrant and she had been vomiting fecal material for several hours. There was no return from enemata except some flatus. W.B.C. was 16,200 per cm. Polys 90% urine showed a trace albumin, Hb. 8.5 grams.

Past history revealed that she had been constipated from birth with frequent bouts of obstipation relieved by enemata and colonic irrigations. Because of abdominal distention and the necessity of missing school for days in order to relieve these symptoms there was somewhat of an emotional problem because her schoolmates believed that she would become pregnant and have abortions performed. There was no previous history of serious illness or operations.

On examination the only positive signs were a markedly distended abdomen with the main protuberance on the left side extending from the pelvis to the rib cage, visible peristalsis, dullness over the mass and mild tenderness in the left lower quadrant with no rebound tenderness.

An immediate operation was ordered and on opening the peritoneum through a lower left rectus incision a shiny thick rubbery mass was revealed which had the appearance of the wall of a large ovarian cyst. After enlarging the incision it was found that the mass extended from the pelvis to the fourth rib anteriorly displacing the diaphragm upward. On delivering the weighty mass outside the belly it was discovered that it was a large hypertrophied sigmoid loop with a long veil of mesentery which was obstructed just above the peritoneal reflection in the pelvis and also at a point about midway in the descending colon. There was no radial torsion but each end of the distended loop had twisted on itself being possible because of the long mesosigmoid. An attempt was made to deflate it by having an assistant insert a rectal tube. When this was unsuccessful aspiration was attempted through the gut wall. However, the contents were mainly inspissated fecal matter and the problem of immediate resection then arose. Incidently, the remainder of the colon was normal in appearance and tone; the patient had vomited whatever fecal contents were above the proximal obstruction.

A Mikulicz double-barrel colostomy was attempted but after the clamps were placed beyond each obstruction there was not enough normal bowel to form barrels. Because of the weight of the mass it was immediately excised and found to weigh a little over twenty-three pounds on a rough scale.

The bowel was 16 cm. in greatest diameter and had the appearance and rubbery feel of an inflated inner tube. Pathological report revealed diffuse fibrosis of the peritoneal covering. The wall was 4 mm. thick. Microscopically there was compression atrophy of the musculature, moderate thickening of serosal arteries with dilatation of veins. Two large nerve trunks showed no significant changes. The mucosa was intact and atrophic.

Before closing the incision a mushroom catheter type intra-peritoneal cecostomy was performed bring the tube out a small right McBurney incision. The clamps were left on each end of the gut. A tight binder was applied to

prevent possible shock because of the large mass removed from the abdominal cavity. Dr. Carnes Weeks of Bellevue had a similar case which was solved by suspending the mass from a Balkan frame until the peritoneum was sealed off.

The clamps were removed on the fifth day at which time she had peristalsis. There was never any shock and her temperature was never over 100.6. There were no antibiotics then.

At five weeks an end-to-end anastomosis was performed when attempts to make two barrels failed because of lack of intestine and it was necessary to make the anastomosis directly over the left iliac vessels.

All wounds closed and normal bowel movements occurred at nine weeks.

At twelve weeks she returned with a small fecal fistula at point of anastomosis. X-ray at this time failed to show obstruction in any part of the colon. There was post-op narrowing at the site of sigmoid. No dilatation was seen.

A Miller-Abbott tube was inserted down to the cecum so that she could be fed normally. The fecal fistula closed and she was discharged on the tenth day. A letter from the patient written 45 months after operation stated she was perfectly well, having one to two bowel movements per day without laxative or enema and that she had had a normal pregnancy and delivery without bowel disturbance two years after operation which was certainly a fair test of an anastomosis at the level of the iliac vessels and indicated a lack of further proximal dilatation of the bowel.

Case 2. M. B. 1 No. 151,719 Lincoln Hospital N. Y. C. Male, Age 59.

Admitted 3-29-46 with a history of severe abdominal cramps after eating one week ago, relieved by vomiting and bowel movement. For the last 30 hours had abdominal cramps and inability to move bowels. Three years previously he had an obstruction caused by "enlarged intestine" operatively relieved at Metropolitan hospital. On investigation this was discovered to have been a volvulus of the sigmoid which was deflated after opening the abdomen.

Previous history revealed only a right inguinal herniorrhaphy 20 years ago.

At this admission significant findings were a markedly distended left lower abdomen and visible peristalsis. Temp. 101, Pulse 96. A Miller-Abbott tube was passed. X-ray revealed marked

gas distention of sigmoid. Another surgeon repeated a deflation operation through a left lower rectus incision. This case was presented at surgical conference the following week and the question was brought up of the next step to be taken when he should again obstruct. This was answered on his thirteenth hospital day at which time I was on service and was called because he had eviscerated. The pathology found was a volulus of the sigmoid with double obstruction of it because it had rotated. Furthermore he had a small bowel obstruction of a loop of ileum which was lodged in the pelvis having migrated to the left of the sigmoid loop at the base of the mesentery and then became kinked in the pelvis. The latter was easily relieved and it was decided to do a Mikulicz resection on the sigmoid loop to effect a permanent cure if the patient could be kept alive. Technically this procedure was much easier than the previous case because it was simple to form two barrels of good bowel and also the main contents of the sigmoid were fluid and gas which were readily aspirated after closing the peritoneum around the two barrels. In this case the sigmoid loop was not removed for two days leaving the intestinal clamps on to test blood supply and allowing the peritoneum to seal itself. A mushroom catheter intraperitoneal

cecostomy was also done in this case. The bowel segment was removed by electric cautery without pain, on the ward.

The specimen measured 24 inches in length and 5 inches in width with reddish blue surface containing white plaques. The mucosa was normal. On section there was a lipomatous gelatinous infiltration between serosal and muscular layers. No unusual microscopic changes in normal architecture of bowel were present. Some chronic inflammatory cells were found in the mucous and serous layers with thickening of the submucous layer.

There was a bleeder in the lower segment which had to be caught after removing the clamp, otherwise convalescence and closure were normal except for a peri-rectal abscess which developed and was cured by drainage.

Fifty-six months after operation the man was asymptomatic with no recurrent distention and regular bowel movements occurred without help and he was able to carry on a job as a garageman.

Treatment begins by ruling out a true obstruction and correcting any co-existing disease or glandular imbalance.

Medical treatment which may suffice in mild cases consists of frequent enemata, mineral oil, diet, abdominal massage, laxatives at intervals and specific drugs. Mecholyl which stimulates the parasympathetics is one of the most useful to produce defecation and yet, to show how little we understand the underlying mechanism of the disease, Syntropan which has an atropine-like action paradoxically will work just as well. Medical therapy can sometimes control the symptoms but is an arduous task and is not curative.

During the thirties great enthusiasm was shown for various sympathetic blocks and many encouraging results reported. The criteria for sympathectomy are: a) failure of medical therapy b) no evidence of tendency to volvulus and c) a good response of evacuation when spinal anaesthesia is given.

Sympathetic block does not allow a bowel which has hypertrophied to return to normal, and not only does it remove the sensory pain warnings of volvulus, impaction or perforation, but about 1937 reports began to come out that these were not infrequent sequelae of the condition early and late after sympathectomy. It was found that medical treatment with or without sympathectomy had a death rate of 58% on the average in a resume of reports. Resection of the superior hypogastric plexus produces sterility in the male. Removal of the second and third sympathetic ganglion causes vasomotor paralysis in both lower extremities. One author feels that sympathectomy should be limited to true Hirscthsprung's disease when there is only mild generalized dilatation.

Surgical treatment varies greatly and is indicated as a last resort in failure of any of the above. Segmental resection is indicated as a primary treatment in cases of limited dilatation such as dolichocolon (functional obstruction from extreme redunduancy) which tends to produce volvulus. It has been reported that after segmental resection other portions of the colon proximal to the lesion become dilated but Dixon reports 41 segmental resections with no recurrences and 25 of the cases have had a complete relief of symptoms. Cattell and others prefer a subtotal colectomy with ileo-sigmoidostomy. Most all of them favor a stage procedure either of the Divine or Mickulicz double-barrel type for safety from contamination, the ease of mobilizating a bowel with long mesentary and to allow the shrinkage of any dilated bowel which is not pathological but dilated or edematous from back pressure. Swenson reports an abdomino-perineal type operation for segmental megacolon of the recto-sigmoid preserving the anal sphincter by freeing the sigmoid and rectum down to the anus then drawing the freed bowel through the sphincter. He argues that rectal achalasia, the absence of normal propulsive waves in rectum and rectosigmoid constitute a physiological defect that results in chronic obstruction, is due to dysfunction or absence of the myenteric plexus. On a similar theory Hiatt does a Kraske-type operation from below after removing the coccyx. Both report several good results. Arguing against the validity of this theory Ritter reports three cases with rectal achalasia in which he removed the dilated portion and the distal dysfunctioning segment return to normal character.

In attempting to discuss this complex as briefly as possible, even discounting the cases due to true obstructive lesions, one can see the variety of problems and the many approaches to it indicate there is still disagreement as to its etiology even if there be one cause. As in all phases of abdominal surgery the mortality now has been lowered mainly because of better under-

standing of physiology and antibiotics. There has been an attempt to show that there is now a better understanding of how to treat this disease than twenty-five years ago, and that the outlook can be more favorable in a condition which, though grave, is fortunately rare.

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CARCINOMA OF THE PANCREAS

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Morgagni described cancer of the pancreas some two hundred years ago, but until recently it has been considered a hopeless disease. The first attempt at radical surgical treatment was made by Codivilla in 1898. The patient died, the surgeon's colleagues were not stimulated, and another 14 years elapsed. In 1912 Kausch did a two stage pancreatico-duodenectomy for carcinoma of the ampulla. This patient died of ascending cholangitis nine months later. For the next twenty-three years palliative procedures were performed to relieve jaundice with its associated symptoms. At first the gall bladder was anastomosed to the stomach, later the duodenum and jejunum were found to be more satisfactory. Occasional cases were reported of transduodenal excisions of small ampullary growths, but it remained for Whipple and his associates to put radical pancreatic surgery on the map in 1935. The two stage operation soon became a standardized procedure. The first stage consisted of cholecystoenterostomy for relief of jaundice. In 1940 when it was possible to prepare jaundiced patients for surgery by the administration of vitamin K, the one stage procedure came into vogue (17).

Most tumors of the pancreas are malignant. Carcinoma of this organ is not uncommon. This tumor, which arises from the epithelium of the ducts, accounts for about 2 per cent of all cancers, and like most cancers finds its highest incidence in the 50-70 age group. It is twice as common in males, and in the older literature is alleged to occur three times oftener in the head than in the body and tail. More recent work indicates that the incidence of the two different types is about equal. The much greater difficulty of diagnosing the latter type probably accounts for the apparent higher incidence of the former. The duration of symptoms is usually short. In one author's collection of 759

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cases from the literature, the average duration of symptoms was 7.1 months, the longest lasting 8 years(1).

Silver and Lubliner in their analysis of 104 cases of carcinoma of the pancreas have made some interesting observations on the signs and symptoms of this disease. They point out that rapid weight loss, for some obscure reason, is characteristic of carcinoma of the pancreas. One would naturally expect such weight loss with obstruction of the pancreatic and biliary ducts, but strangely enough the weight loss is just as striking in patients who have carcinoma limited to the body and tail of the pancreas. All recent writers on the suject are agreed that the textbooks are wrong in describing the jaundice associated with this disease as "painless." As a matter of fact pain is the outstanding symptom and is the one which brings the patient to his doctor in the vast majority of cases. The pain is characteristically worse at night when the patient is lying down, and is relieved slightly by sitting up or walking about. It is frequently aggravated by eating(12). On explanation for the severity of this pain has been propounded by Chauffary and verified histologically by Duff. Cancer cells have been seen extending along the nerve sheaths of the solar plexus, and it is theorized that when the patient lies down on his back the protrusion of the spine and subsequent compression caused by the gland exacerbates the pain. Conversely some relief is gained by sitting up or flexing the thighs over the abdomen. Contrary to popular opinion, jaundice is not an early sign of carcinoma of the head. Other significant symptoms routinely precede jaundice by weeks or months. and it is an unusual case where jaundice will make its appearance early. Of 1,206 cases reported by 17 authors, jaundice was noted in 68.5%. As a rule the jaundice was pronounced and progressive, but remissions occasionally occurred(5). The mechanism of these remissions can best be explained by necrotic tumor tissue sloughing into the duodenum and temporarily relieving the obstruction. Jaundice is seldom seen with lesions limited to the body and tail. Gastrointestinal complaints of nonspecific nature figure prominently in the symptomatology of both types of lesions, and probably result from invasion of the wall of the small bowel. Wide and diffuse metastatic lesions are characteristic of carcinoma of the body and tail, and frequently cause the presenting symptoms. Metastases are only one third as frequent in carcinoma of the head, probably because of its "boxed in" situation. Diabetes and other less severe disturbances of carbohydrate metabolism are found in a high percentage of cases of carcinoma of the body and tail, but are seldom associated with carcinoma of the head. Berk considers abnormal glucose tolerance curves of great diagnostic significance in suspected cases of carcinoma of the pancreas. Diabetes has been projected as a predisposing cause of carcinoma of the pancreas. McKittrick and Root reported that 32 per cent of all cancers in diabetics they studied involved the pancreas. One of the most baffling discoveries to come out of cancer research in recent years is the association of multiple venous thromboses with carcinoma of the body and tail of the pancreas. Kenney, in his study of 51 cases of pancreatic cancer found no venous thromboses associated with carcinoma of the head, while 33 per cent of those whose cancer was limited to the body and tail had multiple venous thromboses(9). The implication that pancreatic cancer in some way alters the blood clotting apparatus is obvious, but the mechanism is not understood. Any patient with unexplained peripheral edema, particularly unilateral, should be suspected of suffering a venous thrombosis, which in turn should bring to mind the possibility of carcinoma of the body of the pancreas. By the same mechanism, thrombosis of the portal vein with resultant ascites is four times more common in carcinoma of the body. Another sign, steatorrhea, is as we would suspect, more common in lesions involving the head of the pancreas. These other signs are interesting if present, but the common signs of carcinoma of the pancreas may be boiled down to two. A palpable gall bladder is noted in approximately fifty per cent of jaundiced cases (the liver is usually palpable also), and an epigastric mass is palpable in slightly less than half the cases(7). Malignant tumors arising in aberrant pancreatic tissue have been reported. This tissue is most likely to be found in the wall of the duodenum, but has been reported in dozens of other locations (16).

Laboratory tests for carcinoma of the pancreas are helpful only when positive, and are seldom positive in early lesions. The tests most commonly employed are those which determine jaundice and pancreatic insufficiency. Posi-

tive findings which may be associated with this disease include anemia, hyperlipemia, fatty or bloody stools, positive Van den Bergh, high icterus index, absence of urobilinogen from the urine, presence of excessive bile in the urine, clay colored stools, meat fibers in stools, impaired glucose tolerance, hyperglycemia, glycosuria, elevated blood amylase and lipase, and duodenal drainage containing no pancreatic ferments but perhaps a few red blood cells(10). Most of these laboratory findings are associated with moderately or far advanced lesions of the head of the pancreas. The x-ray is some help, although its application to this field of diagnosis has rather definite limitations. It is of no help unless the duodenum is distorted. Much emphasis has been placed on Frostberg's "reversed 3" sign. It is indicative of edema of the papilla secondary to neoplasm in the vicinity of or actually in the ampulla. Other distortions which suggest neoplasm include ulceration, rigidity, and replacement of the normal rugal pattern of the duodenum by irregular coarse markings. Gross distortion of the C-loop, of course, is prima facia evidence of tumor. Roentgenological examination was of considerable help in detecting 32 of 68 cases without jaundice reported from the Mayo clinic in 1933(6).

All the diagnostic difficulty which surrounds the average case preoperatively is insignificant compared to the uncertainty which plagues the surgeon who explores the abdomen. Extremely difficult to differentiate grossly is chronic pancreatitis, which may render the pancreas stony hard, but which will regress if left alone and the biliary tract drained. Complicating the problem still further is the fact that the lesion most amenable to surgical cure, the small, deep-seated carcinoma of the head, is usually surrounded by a thick shell of chronic pancreatitis. A superficial biopsy will miss the neoplasm, while a deep biopsy is associated with greater danger from leakage of pancreatic juice(13). In no procedure is a satisfactory outcome more dependent upon astute surgical judgment. Once the decision has been reached that carcinoma of the head of the pancreas is present, the surgical attack must be considered. With a few minor variations, the radical operation of pancreatico-duodenectomy has been fairly well standardized. One should first incise the peritoneum along the lateral border of the duodenum allowing mobilization of the head of the pancreas and inspection of the portal vein. The pancreatico-duodenal artery must not be cut until it has been determined that the tumor can safely be dissected from the portal vein and superior mesenteric vessels. If the tumor is operable, one will proceed to transect the following structures: The ligament of Treitz, the stomach thru its lower third, the neck of the pancreas over the superior mesenteric vessels, the common duct at the level of the superior border of the first segment of the duodenum, and the jejunum a few centimeters distal to the ligament of Treitz. The common duct and stomach are then anastomosed to the jejunum. Most authors favor anastomosis of the neck of the pancreas to the jejunum in an attempt to preserve some external secretion(21). Brunschwig(4) prefers to suture the cut end of the neck of the pancreas, rather than anastomose it to the jejunum. He has observed that the majority of patients get along quite well without any external pancreatic secretion. To those who do not he gives pancreatin by mouth at mealtime. No other substitution therapy is apparently needed. In his study of this problem Whipple(19) reported that only about 20 per cent of patients deprived of their external pancreatic secretion developed significant disturbances of fat metabolism, the most important being fatty degeneration of the liver. Most writers are agreed that the enteric stream must not be allowed to pass over the opening of the common duct. Fatal cases of cholangitis have been reported when this precaution was not taken. Waugh and Clagett in summarizing their thirty cases of pancreaticoduodenectomy conclude that a postcolic, anti-peristaltic gastrojejunostomy distal to the biliary and pancreatic anastomoses is the procedure of choice. They also prefer the one stage procedure wherever possible and feel that pancreaticojejunostomy has definitely improved the prospect of normal postoperative nutrition. They prefer choledochojejunostomy to cholecystojejunostomy, and have made the interesting observation that postoperative survival is encouraging in those patients whose carcinoma was primary in the ampulla of Vater(18). Siler and Zinninger's report was much less encouraging. They had eight cases of proved ampullary carcinoma with a resectability rate of 50 per cent and a ten year mortality rate of 87.5 per cent. Their statistics on carcinoma of the extrahepatic bile ducts agree

with other reported series—a resectability rate of 10% and ten year mortality rate of 100 per cent(15).

The operation for resection of the body and tail of the pancreas is considerably more simple than the foregoing procedures. The pancreas is approached by dividing the gastrocolic ligament. The stomach is retracted upward and the transverse colon downward. The spleen is freed from its various attachments and used as a handle to pull up the tail and body of the pancreas, which is then transected at the level of election. Total pancreatectomy may be accomplished by a combination of the first two procedures. It is re-emphasized that totally pancreatectomized man is only moderately diabetic, requiring 20 to 40 units of insuluin a day(3).

Carcinoma of the papilla of Vater can frequently be resected transduodenally. After the duodenum has been opened the tumor is encircled by an incision extending thru the wall of the duodenum back into the substance of the pancreas to get well around the neoplasm. The transected bile and pancreatic ducts are then sutured into the wound, and the cut edges of duodenum brought together around the ducts (4).

Unfortunately the victim of pancreatic cancer usually presents such an interesting challenge in differential diagnosis that he does not come to surgery until a more than adequate period for study has elapsed. In the meantime he has lost the chance for a surgical cure. His few remaining months may be more comfortable by cholecysto-enterostomy. This particular operation is still the only surgical treatment which can be offered the majority of these patients.

A general idea of the results of pancreatic surgery is presented by Whipple(20). Some 165 radical operations are reported out of 4 of the country's largest surgical centers. The postoperative mortality for the entire series is 30 per cent, although this figure would be less than 20 per cent if the series were limited to cases done in the past 2 years. Some 20 per cent of these patients are alive, well and without evidence of recurrence 6 months to 6 years after surgery. Inasmuch as over half of all the pancreatic surgery ever done has been accomplished very recently, significant statistics on operative mortality and 5 year cure are not yet available.

The irradiation treatment of malignant tumors of the pancreas may be disposed of by saying that a proven case has never been cured by this modality. In all fairness, however, one must acknowledge that a great number of patients have shown remarkable temporary improvement following irradiation therapy. A trial of x-ray should not be denied any patient in whom a primary resection cannot be accomplished (2, 11).

Sarcoma

Sarcoma of the pancreas need be mentioned only for the sake of completeness. Goldstein(8) reviewed 19 cases from the world literature in 1922. Since then, approximately one case per year has been reported. Most of these cases probably were not primary in the pancreas, and many more were not true sarcomas. From the microscopic descriptions one would surmise that a good number were metastatic melanoma or carcinoma. Shoemaker in 1941 reported 7 cases from the records of the Los Angeles General Hospital. The prognosis of such lesions is indicated by the inclusion of the autopsy protocol with all reported cases(14).

Summary and Conclusions

(1) The attitude that cancer of the pancreas is a hopeless condition is not only untenable, but inexcusable in the light of present day knowledge.

(2) The use of blood, antibiotics, vitamin K, and silk technique have brought the operative mortality below 20 per cent.

(3) Both the operability and curability rates of cancer of the pancreas are rising as patients are brought to surgery earlier in the course of the disease. Unfortunately the majority of patients are still "studied" until their chance for surgical cure is gone.

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LATERAL CYSTS AND FISTULAS OF THE NECK

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The embryonic origin of lateral cysts and fistulas remains controversial. There are primarily two schools of thought: (1) that they are derived from a branchial cleft, (2) that they are derived from the embryonic thymic duct. The first group would term these: "Branchial Cysts and Fistulas" and the other would call them "Thymopharyngeal Duct Cysts and Fistulas." This author favors the latter, as these cysts and fistulas are found in the same anatomic location as the embryonic thymic duct which descends from the third branchial pouch in the lateral pharyngeal wall and proceeds to the lateral side of the neck, over the carotid sheath, under the sternomastoid, and finally comes to rest in the mediastinum to become the thymus. Rather than enter into the controversy the author has used the apeasement term: "Lateral Cysts and Fistulas of the Neck." They should, however, not be confused with the preauricular sinus which probably is of truly branchial cleft origin.

CLINICAL PICTURE:

The so called lateral cyst (branchial or thymic) usually manifests itself as a painless swelling in the lateral side of the neck. The cyst is always unilocular and may be as small as 1 cm in diameter or it may also fill the entire side of the neck. The tumor is semi-fixed, uniform and non-translucent. It is not attached to skin and usually occurs in the upper third of the neck in definite relationship to the deep anterior fibers of the sternomastoid muscle. Although the cyst may bulge posteriorly, it invariably lies anterior to the carotid sheath. Distribution is equal between sexes and between the right and left side. Bilateral cysts do occasionally occur. Duration may vary from very recent to many years. Trauma does not seem to be a participating factor.

Ordinarily the cyst will cause no particular trouble until infection sets in, not infrequently following a sore throat. Thirty per cent of the patients seen by us have had previous infections with one to many incisions and drainage. Other complications do occur. Cough due to vagal stimulation has been reported. In a series of 33 patients reported by the author(1), one patient had difficulty in breathing and swallowing due to pressure of a large cyst. In another patient purulent thyroditis in a nodular goiter developed a few days after an infected cyst was incised and drained. Another had brachial plexus neuritis following removal of an infected cyst. Carcinoma has been reported, but Neal and Pemberton(2) in a series of 319 cases from the Mayo Clinic did not find a single instance of carcinoma. They made the statement that the diagnosis of branchial carcinoma is probably erroneous. Hendricks and Ward(3) in a recent article, however, had proven cases of carcinoma developing in a branchial cyst.

The lateral fistula (branchial fistula, thymic duct fistula) occurs about one tenth as frequently as does the cyst. Although it is frequently caused by ill-advised incision and drainage, true congenital fistula does occur. The opening may occur at any level but is invariably in relationship to the anterior fibers of the sternomastoid muscle, and the tract almost always follows a source just beneath these muscle fibers over the carotid sheath up to a point just beneath the midportion of the posterior belly of the digastric muscle, where it arches medially to enter the lateral wall of the pharynx in the vicinity of the tonsil. The discharge is of a milky, mucoid material and because of the pharyngeal communication, infection and purulent discharge is commonplace. Both cysts and fistulas are lined with stratified squamous epithelium on a lymphoid stroma.

DIFFERENTIAL DIAGNOSIS:

A unilocular, non-translucent cystic swelling or fistulous tract which occurs in relation to the deep anterior fibers of the sternomastoid muscle is most likely a lateral (branchial) cyst.

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If aspiration yields cholestrol crystals, the diagnosis is definite. Other lesions to be differentiated are: thyroglossal cysts and fistulas, carotid body tumors, dermoid cysts, inflammatory and tubercular adenitis, socalled aberrant thyroid, lipoma, sebaceous cyst, neurofibroma, cystic hygroma and preauricular fistula.

Thyroglossal duct fistulas and cysts occur in the midline and invariably move when the patient swallows.

Carotid body tumors are very rare. Lahey(4) recently reported 22 cases occuring at the Lahey Clinic. Such tumors as Lahey(4) pointed out lie deeper than branchial cysts. Other distinguishing features are that they may be moved laterally but not vertically. They transmit pulsation from the carotid due to their location in the carotid bifurcation crotch. A bruit may be present. Lahey(4) has stated that these carotid body tumors are rarely malignant and the operation itself is hazardous. Aspiration may be warranted if doubt exists, as surgery of a carotid body tumor should not be undertaken without careful consideration.

A dermoid cyst may not be differentiated until its contents are examined. Probably one out of ten cysts in this location will be a dermoid cyst.

Lymphadenitis is usually bilateral and more than one node is involved. The nodes are tender and the offending focus can usually be traced. Tuberculous nodes are hard and matted. If there is a discharging sinus tract it is undermined, and the discharge may be caseous.

Aberrant thyroid is a misnomer. These are all metastatic carcinoma from a primary lesion in the thyroid, but they do frequently occur along the jugular group of nodes and may occur singly. Careful search may reveal a node in the thyroid gland on the ipsilateral side in a fair proportion of cases. It is in this group, however, where most of our mistaken diagnosis of branchial cysts have been made. They are, however, definitely deeper than branchial cysts.

A lipoma is soft. As a rule it is more superficial and the wavy contour of the overlying skin will be characteristic.

A sebaceous cyst is invariably superficial and is attached to the skin, usually with associated comedo.

Neurofibroma is rare. It is a firm, alongated nodule and lies along the course of a major nerve. The exact nature of the lesion may not be determined preoperatively but the discovery (at exploration) of a nerve stalk at both ends establishes the diagnosis.

Cystic hygroma usually occurs in the supraclavicular area but may occur anywhere in the neck and may extend into the mediastinum, axilla or arm. It is soft and flabby, and practically always multilocular. It is translucent except in cases where there has been hemorrhage. The fluid is straw colored and congeals after aspiration.

A preauriculuar sinus occurs in front of the ear and at a level with the upper portion of the ear. Inasmuch as the tract is lined with epithelium containing sweat and sebaceous glands, the secretion is of sebaceous debris deep in the tract. It is invariably present since birth and there is usually a history of many bouts of recurrent infection with more or less continuous discharge. The tract usually goes directly in and no deeper than the level of the tympanic membrane. It is debatable whether these tracts originate from a branchial cleft or an inclusion of the primitive six nubbins that form the external ear.

TREATMENT:

A lateral (branchial) cyst should be excised before infection appears. If the patient is in early infancy excision may be deferred until age two or later. In about twenty per cent of cases infection will be present when the patient is first seen. Removal at this time is inadvisable—in fact technically difficult or impossible—surgery should not be carried out until the infection has completely subsided. In the presence of infection; antibotics, aspiration, and occasionally incision and drainage are performed and no attempt at removal is made for at least an interval of two months after the infection has subsided.

For the removal of a so-called branchial cyst the author prefers to make a horizontal incision through skin and platysma. After the flaps are well reflected the cervical fascia is incised along the anterior fibers of the sternomastoid muscle. The approach should always be in front of the muscle even thouguh the cyst may bulge posteriorly, as the cyst always lies anterior to the carotid sheath. It may be necessary to reflect the sternomastoid muscle considerably laterally, or even to section a portion of it, but this is less hazardous than a posterior approach which first encounters the carotid sheath. If one er-

roneously operates too soon after infection there will be no line of cleavage and it would be safer to simply incise the cyst wall, touch the interior with iodine and place a guaze pack into the cavity and remove the cyst at a later date. The author has had this experience on three occasions. In one case the cyst wall collapsed without recurrence when the pack was removed. In the other two patients the cysts were removed in two months. A definite line of cleavage was then found and total excision was possible.

In he management of the fistula, incision described by Lahey(5) and Bailey(6) is preferred. This is the so-called stepladder incision. A horizontal elliptical incision is first made around the tract, which is then dissected upward beneath the cervical fascia as far as possible. A second horizontal incision is then made and the tract transferred into the upper incision. From here dissection of the tract is carried beneath the posterior belly of the digastric directly to the lateral pharyngeal wall. At this point an assistants finger pushes out at the lateral wall of the pharynx for further orientation and the tract is hen ligated flush with the pharyngeal wall. When properly managed a cure should be expected in all cases.

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CANCER OF THE COLON AND RECTUM
A PLEA FOR EARLIER DIAGNOSIS

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It is a well-known fact to any physician who has had experience with carcinoma of the colon and rectum that patients with this disease will procrastinate from having an adequate investigation longer than those of any other form of cancer. It is also generally accepted that carcinomas of the colon and rectum offer a larger percentage of five year cures than any other type of cancer with the exclusion of skin carcinoma. Carcinoma of the colon and rectum is certainly not an uncommon disease, yet in many cases the diagnosis is not established till late in the process of the disease. One must remember that the diagnosis of carcinoma of the colon is a comparatively simple thing in the late stages. However, in many cases, it is very obscure at an early stage when operative interference will offer the greatest hope for cure. Knox Vinton of Rochester, New York reported in the American Journal of Digestive Disease in 1942 that during 1939 while accidents caused 120,000 deaths; respiratory diseases, 92,000; and tuberculosis 62,000, the various forms of cancer killed 154,000 people in the United States. Approximately 17 per cent of the 154,000 cancer deaths are due to cancer of the colon and rectum. This high mortality from carcinoma of the colon and rectum should provoke the interest of every member of the medical profession. Failure to cure the carcinomas of the colon and rectum are not due to a lack of operative technique.

Diagnosis of carcinoma of the colon and rectum is not difficult even in its earlier stages once the possibility or the presence of this disease is given some consideration. That it is not given consideration in many cases is shown by the fact that an interval of ten to twelve months, duration of symptoms elapses before the diagnosis is made. The delay in early diagnosis also explains the fact that in carcinomas of the colon and rectum only about fifty per cent are candidates for radical operative surgery. Even with this low percentage of candidates for operative interference, there still is a survival rate of about forty six per cent.

It is striking that a large percentage of patients with carcinoma of the colon and rectum have been treated for hemorrhoids either by hemorrhoidectomy or by injections for some time before diagnosis is made. In a large percentage of cases where hemorrhoidectomies or injections have been done, the carcinoma is within reach of the examining finger by rectal examination. It should always be the doctor's responsibility to consider the possibility of malignant disease of the colon and rectum before

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more advanced signs are present. It has been pointed out by Hanshen, of the Council Bluffs Clinic, that loss of weight a palpable tumor or mass in the abdomen, anemia and cachexia are not symptoms of carcinoma of the colon. These are terminal symptoms of metabolic and mechanical derangement of normal vital processes and occur with advanced disease. Symptoms produced by carcinoma of the colon and rectum will, in many instances, depend upon the location in the large bowel and rectum. It is intended to again remind us of the symptoms and signs of carcinoma in the colon and rectum in its early stages so that doctors may not be pointed out as being so negligent in this malignant disease.

For the purpose of simplicity, the discussion to follow will be under the headings of history and physical examination.

The diagnosis of malignant disease of the colon and rectum can be made in a large percentage of the cases, or at least suspected, by the history itself and later can be confirmed by examination.

1. *Alterations and changes in bowel habits*: Carcinomas in various sites of the colon and rectum, particularly the colon, will produce changes and alterations of the bowel habit. Carcinomas of the cecum and ascending colon may produce changes in the bowel habit such as constipation and diarrhea, rather late, while lesions of the left side of the colon, particularly the rectosigmoid, may produce signs of obstruction much earlier. This is easily explained because of the fact that the feces are much more liquid in the right half, than in the left half of the colon and rectum. The closer the carcinoma is to the ileocecal valve, the earlier the symptoms of obstruction may appear in the right half of the colon; and just as often as in the left half of the colon. Cromar, Morgan and Dixon reported sixty-one cases of cancer of the colon and rectum that measured less than 2.5 cms. in diameter. While these are very small lesions, yet fourteen of these in the proximal part of the colon had caused symptoms of intestinal obstruction. While constipation is one of the earlier symptoms of carcinoma of the large bowel, diarrhea may occur and in 15 per cent according to Freed, Morwell and Feldman, of Baltimore, Maryland. Furthermore alternating diarrhea and constipation occurred in 10 per cent of their cases. Because a patient gives a history of life long constipation it does not necessarily rule out carcinoma of the large bowel and rectum. Careful inquiry into the history of these patients may reveal the fact that the constipation has suddenly gotten worse recently. This certainly should make one think of the presence of carcinoma of the colon and rectum. Carcinomas of the rectum do not so frequently give the history of constipation but of a diarrhea, particularly with much tenesmus if the lesion encroaches upon the internal sphincter in the rectum. Some patients complain of very foul smelling stools particularly when the carcinoma has reached a period of growth in which there is some obstruction. This is due to sudden evacuation of obstructed fecal content which has undergone decomposition. Other symptoms such as the loss of appetite, gaseous eructions, nausea, and flatulence may be present. Indeed, these maybe the symptoms that first brings the attention of the patient to the fact that there is something wrong, particularly in the carcinomas of the cecum and ascending colon. These, will increase as the process of the obstructive lesion increases. In carcinoma of the distal colon progressive constipation is much more marked.

2. *Pain*: Pain is variable. Abdominal pains and cramps vary according to the location of the growth. Early in carcinomas of the cecum and ascending colon there is vague abdominal discomfort referred to the epigastrium accompanied by pain referred to the lower right quadrant. This, is pain of the obstructive type the closer the carcinoma is situated to the ileocecal valve. Leahy, in an article on Diagnostic and Prognostic Signs of Cancer of the Colon and Rectum in 1945, based on 300 cases of carcinoma of the colon and rectum by Swinton, stated that in carcinoma of the rectum, dull pains and cramps were present in 7 per cent; left colon, 77 per cent; right colon, 87 per cent, and a total of 57 per cent of patients with carcinoma of the colon and rectum showing abdominal cramps or pain. It has been pointed out by Leahy, Feldman, Barkens and others that bowel pain and discomfort will occur as a primary symptom of the disease in as much as 50 per cent of the cases and as the disease develops will go as high as 75-80 per cent. It is not an uncommon thing to have appendices removed for recurrent attacks of pain and discomfort in the lower right quadrant when there

was a carcinoma in the upper cecum and ascending colon. Many times reflex disturbances in the upper intestinal tract due to carcinomatous lesions in the right colon will distract one's attention from the primary lesion. In the transverse colon, intestinal discomfort such as colic and pain are early symptoms. With increasing obstruction due to the carcinoma, the pain, is colic in type, and becomes more intense and severe. Pain in the left side of the colon may be only discomfort in the left lower quadrant at first. However, as the obstruction progresses, abdominal distention and colicky pain become more prominent. There may not be much discomfort in rectal carcinoma unless there is encroachment on the lower part of the rectum. Pain here is mostly in the form of tenesmus and a feeling of incomplete evacuaution of the bowels.

3. *Hemorrhages* Hemorrhage or blood in the stool occurs most frequently in carcinomas of the rectum. Here, one of the early symptoms is rectal bleeding. This frequently causes the patient to report to the doctor that hemorrhoids are resent. Blood, in the stool occurs in anywhere from 80-90 per cent of the rectal cancers, while in colon carcinoma it is only around 40-50 per cent. In cancers of the right colon, bleeding occurs in 9 per cent. In the right colon bleeding occurs often but is overlooked on account of the dark character of the blood. This probably accounts for, a lower percentage of history of bleeding. One must inquire carefully into the character and color of the stool to get the history of bleeding. While it has been mentioned that blood in the stool may be masked as far as the patient is concerned by the color of the stool, ulcerating lesions on the left side of the colon and rectum provokes the attention of the patient because the blood is bright red. Some patients will give a history of some bleeding prior to the development of the carcinoma. This bleeding, may be caused by a benign polyp. The polyp may bleed for sometime before undergoing malignant change. This has been pointed out by Leahy who has said that 3 per cent of people have polyps in the rectum or colon, the discovery of which will not insure them against the possibility of later carcinoma. These lesions are known to degenerate malignantly in a high percentage of cases. Discovery of some benign lesion that would cause a hemorrhage, such as posterior anal ulcer, fissure or hemmorrhoids does not exclude a carcinoma developing higher up out of reach of the examining finger or even the proctoscope. It should be routine practice, although a benign lesions has been discovered that causes bleeding, to perform a barium x-ray examination.

Other symptoms such as cachexia, toxemia, loss of weight, anemia, and dyspepsia are common. These may be late symptoms except in carcinomas of the right side of the colon. Many times the first symptoms are loss of weight, anemia, and cachexia.

It has never been explained why carcinomas of the right side of the colon may reach the stage of palpability yet be resectable, while carcinomas of the left side of the colon and rectum when they have approached this stage of development, as a rule, cannot be resected. Also there is such a thing as "silent" carcinoma of the large bowel. That is, there are carcinomas that produce no particular symptoms and are discovered accidentally in a routine examination. Stroll and Bargens reported a series of (6.7 per cent of such cases). Loss of weight may be as much as 40-45 pounds. Progressive anemia, of secondary type, usually appears late on the right side of the colon.

Physical Examination:

In most instances when a palpable mass can be determined on abdominal palpation, carcinoma of the colon is in a late stage. In some cases, this sign may be the first objective manifestation. Tumor masses of the colon may at one time be definitely palpated while on another occasion they may not. This is due to changes in the position of the bowel. Especially is this true in growths in the cecum and descending colon. Carcinomas in the hepatic flexure are very difficult to palpate, because they may be obscured by the overlying liver. In a small percentage of cases palpation of the left side of the colon or transverse colon may give referred pain over the cecal area in carcinomas of the cecum. This is explained by the pressure on the colon producing tension in the cecum where an ulcerating lesion is present. In late stages of carcinoma of the colon, palpable masses can be made out in over 50 per cent of cases. Many times abdominal palpation will give tenderness directly over the carcinomatous area of the bowel, especially in late stages and when there has been some leakage through a perforation

or when a large amount of secondary infection is present.

Digital Examination: In about 60 per cent of cases of carcinoma of the rectum the carcinomatous growth is within reach of the examining finger. Digital examination also gives some idea of the mobility of the growth, which would influence the prognosis and operability of the carcinoma. There is usually a typical feel to carcinomas of the rectum on digital examination. There is a large, hard, elevated border with an excavated center in the central portion of the mass. Many times the folds in the rectum will not reveal an early carcinoma as seen through the proctoscope while digital examination will give the examiner the correct estimation of the disease. One portion of the rectum low in the ampulla, cannot be seen by a proctoscopic examination or be revealed by x-ray examination and can only be felt and discovered by digital examination. There is no question that carcinomas of the ampulla are missed because of the lack of a digital examination even though proctoscopic examination has been carried out. Further, digital examination will help one determine the location of the growth in the rectum and should always precede sigmoidoscopic examination. In all disturbances of the bowel function a digital examination should never be neglected. In fact, a gastro-intestinal investigation is never complete without digital examination.

Sigmoidoscopic Examinations All gastro-intestinal examinations for any chronic disturbances of bowel function are not complete without a proctosigmoidoscopic examination. In the use of the sigmoidoscope one should remember that the insertion of the sigmoidoscope and withdrawal should be done several times before completing the examination. Especially is this true in the withdrawal of the sigmoidoscope as some hidden lesion may be located in the folds of the mucous membrane and be obscured unless the slow withdrawal and thorough examination is carried out. Furthermore sigmoidoscopic examination will reveal polyps of the rectum and recto-sigmoid which are, as has been pointed out, potential malignancies. Lesions of the descending colon cannot be seen with the sigmoidoscope but the fact that blood, pus and debris may be seen on the rectal wall through the proctoscope and sigmoidoscope should certainly aroue one's suspicions of carcinoma lying beyond the reach of the sigmoidoscope. On two occasions in our series of cases, carcinoma could not be demonstrated by x-ray but a laporatomy was done on the strength that pus, blood and debris which could be seen on the rectal wall. Exploratory laporatomies disclosed lesions of the descending colon which were very early and were not diagnostic by x-ray examination.

X-ray or roentgenologic examination of the colon: A single x-ray examination of the rectum or colon should never be relied upon as a final diagnostic procedure. It is true that x-ray evidence of carcinoma of the colon, may, in many instances, be elicited long before clinical manifestations exhibit themselves. An upright view should always be taken and a double enema of barium and air should always be taken for mucosal studies. This was brought out in an excellent article by Jocoby and Lutz of New York City. Carcinoma is a lesion developing in the mucous membrance and extending from it and the study of mucosal patterns reveals earlier lesions. This also helps differentiate other benign lesions that develop outside of the bowel and produce symptoms by protrusion into the bowel. Three cases that were missed by ordinary barium enema examination were clearly shown by definite mucosal studies. One should rely upon the radiologist to prepare the patient before examination when one suspects carcinoma. The radiologist should be given full rein in the preparation of the patient before barium enema examination so that he may carry out air contrast which is nearly impossible unless the patient has been properly prepared beforehand. The degree of contractility and elasticity of the colon can be determined only by mucosal study methods and many times it is completely obscured by the use of routine barium enemas. All carcinomas of the rectum and large bowel start at one point in circumference in the mucous membrane, and it is possible that as the lesion is visualized in the roentgenogram to make a rough guess as to the length of time the lesion has existed. This gives us some idea of the possibility of there being distant metastases. Leahy states that when a carcinoma of the colon or rectum has become annular it can be assumed that such a lesion is six months to a year old, and that when, in addition to this, the lesion has not only become annular, but his extended around the tube of the bowel so that the lesion is canalized to such an extent that a

definite canal can be seen in the roentgenogram, it can be assumed that another six months is required for the growth to extend along the tube of the bowel to produce the canalization. It can, therefore, be said that any annular lesion of the colon and rectum is a miminal of six months old and that an annuluar lesion that has become canalized is, in all probability, a minimal of nine months to a year old and that these lesions that are old, in a very large number of cases, will prove inoperable. Therefore, it is important that studies of the mucosal pattern be done to detect these lesions before these annular strictures take place.

It is evident that the surgeon should work in close harmony with the roentgenologist and leave the examination of the rectum and colon up to him entirely in so far as the x-ray diagnosis is involved.

In Conclusion: It has been pointed out frequently by different authors that usually two persons are to blame for delay in diagnosis of carcinoma of the colon and rectum. These two people are: the patient and the first consulting doctor. The patient is totally unaware of what is going on and is reticent to have proctoscopic and colonic examination. The first consulting doctor, on the other hand, many times has exhibited a woeful lack of interest in this condition or has an aversion for rectal diseases. He is too ready to discontinue examination when some benign condition such as gallbladder disease, ulcer, fissure or hemorrhoids is found and he has not suspected a malignancy of the bowel. 60 per cent of all large bowel malignancies are within the lower ten inches of the bowel, and are readily demonstrable.

Although the present cancer campaign may result in much cancer phobia and hysteria it must be realized that none of these benign conditions will kill the patient while cancer will. Furthermore, it is incumbent upon the first consulting doctor to consult freely and work continuously and in harmony with the surgeon, the roentgenologist, and the internist. If this is carried out, in the near future more early carcinomas of the large bowel and rectum will be found, and be amenable to extirpation.

RESULTS OF ONE HUNDRED CRANIOTOMIES AT THE ARIZONA STATE HOSPITAL*

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One hundred craniotomies were performed between October 13, 1947 and February 7, 1952, on ninety patients who resided at the Arizona State Hospital. This work represents the operative phase of the diagnostic and therapeutic program of the Neuro-surgical Unit of the hospital, and may be subdivided in the following manner:

I. Psycho-surgery Project
II. Epilepsy Project
III. Miscellaneous neuro-surgical problems

A brief description is presented of the projects involved, and also an accounting of the results of neuro-surgical treatment of these patients, who were refractory to other methods of treatment and accordingly were faced with permanent institutional care.

I. *Psycho-Surgery Project*

The utilization of neuro-surgery as a therapeutic weapon for dealing with some of the more severe psychoses was reported by Dr. Egas Moniz in 1935(1). For some years prior to this, he had entertained the thought of interrupting frontal lobe projections for this purpose because of the clinical observation of improved behavior in certain patients with injuries or tumors in this area, and on the basis of the behavioral changes in the chimpanzees, Becky and Lucy, following bilateral removal of the frontal areas (Fulton and Jacobsen)(2). The degree of later success of this concept is indicated by the fact that the Nobel prize winner for 1949 in Medicine was Moniz,–for his work in the field of psycho-surgery. Frontal lobotomy was introduced in America in 1936 by Freeman and Watts(3).

The undesirable effects of the frontal lobotomy operation are well known, including: changes of personality in respect to loss of social consciousness, ambition, imagination and foresight, along with a fairly low percentage of post-operative complications, such as hemorrhage, infection, epilepsy and urinary incontinence. The beneficial results of normalized emotional responsiveness following these procedures have

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been sufficient to justify them from the standpoint of rehabilitation,—but, more selective procedures are being studied with the hope of obtaining the improvement, with a reduction of the undesirable side-effects of the surgery.

Our project has concerned the selection of fifty-seven chronic mental patients for psychosurgery and the evaluation of the effects of bilateral orbitofrontal lobotomy performed from October 13, 1947 to February 7, 1952, as a treatment for these patients (Green, Duisberg, and McGrath)(4). Orbitofrontal lobotomy was decided upon instead of the more extensive standard frontal lobotomy in order to attempt to reduce the undesirable blunting of personality which follows the latter procedure, and predicated on the encouraging but unconfirmed clinical reports of Hofstatter and associates in 1945(5) and the known anatomic and physiologic evidence of concentration of frontothalamic projections thru' the orbitofrontal areas Clark (6), von Bonin and Green(7).

Selection of Patients: The patients were all committed to the state mental instituion, and had resided there for an average of eight years, not responding to the standard therapy, including shock, etc., and in most instances being disturbed to the degree that confinement on closed wards was a necessity. Following referral from the Psychiatric Staff of the hospital, the patients were examined by two psychiatric consultants (R. E. H. D. and W. B. McG.). Fifty seven patients were considered to have sufficient emotional responsiveness with their psychiatric abnormality to warrant consideration of surgical intervention. Thus, the estimation of degree of emotional "charge" was based upon the complaints, behavior and autonomic status, and to a degree, constituted the major indication for surgery. Without such abnormal responsiveness, the operation is contra-indicated. Further studies included psychometric, electroencephalographic, pneumoencephalographic, spinal fluid, and medical evaluations in almost all cases prior to neuro-surgical recommendations.

Surgical Technique: Utilizing Sodium Pentothal anaesthesia, 1½ inch crown trephinations were made in the low frontal areas on both sides at measured point (3 cm. posterior to the lateral rim of the orbit and 6 cm. perpendicularly above this). Under direct vision, thereby following a generally accepted basic principle of adequate surgical exposure, lesions were placed in the orbitofrontal areas above the plane of the wing of the sphenoid bone and sparing the upper quadrants of both frontal lobes.

Results of orbitofrontal lobotomy: Fifty-seven patients have now been studied by us for four to fifty-five months following surgery. Evaluation of results in each patient was based on a combination of psychiatric and psychometric determinations, the social adjustment of the patient either in or outside of the hospital, and information obtained from questionaires submitted to relatives.

Twenty-four patients were improved to the point that they have been discharged from the hospital and are now living at home. Eleven of these are independent and self-supporting, eight are partially self-supporting but require some supervision, and five require care and observation.

Thirty-one patients have remained in the hospital, with the majority (18 patients) becoming improved to the degree that they can be handled on open wards and in many cases assist on ward or ground crews. Four of these persons could be sent home if their home environment was satisfactory. Twelve patients have shown temporary or no improvement, and one is worse. Two patients have expired: causes of death were: (1) Arteriosclerotic heart disease, hypertension, and cardiac decompensation, 12 months following surgery, and (2) Cerebral thrombosis, hypertension, diabetes mellitus and bronchopneumonia, one week after surgery. Neither are considered as operative fatalities.

Thus, 42 patients can be said to have been improved in varying degrees with 24 home and 18 still in the hospital in this category. (11 patients have regressed after temporary improvement, and 5 patients have improved after showing no immediate benefits.

There have been three instances of post-surgical infection, three cases of convulsive abnormalities post-operatively, but no complications referable to hemorrhage or urinary incontinence.

Table I depicts clinical results according to diagnostic categories.

These results compare favorably with other published reports. Fulton(8) in summarizing the results as reported at the December 1948 meeting of the Association for Research in Nervous and Mental Diseases commented that 35-50% of the hospitalized cases were reported as

RESULTS OF ORBITOFRONTAL LOBOTOMY
57 PATIENTS DURING 4–33 MONTHS

DIAGNOSIS	AT HOME			IN HOSPITAL			DEAD
	IMPR.	PARTLY IMPR.	BEHIND	IMPR.	UNIMP.	WORSE	
SCHIZOPHRENIA, 45 CASES							
CATATONIC	2	4	4	6	4		
PARANOID	5	1	1	7	3		1
HEBEPHRENIC				3	3	1	
TOTALS	7	5	5	16	10	1	1
MANIC DEPRESSIVE 5 CASES, ALL MANIC	2	1		2			1
INVOLUTIONAL PSYCHOSES 2 CASES, PARANOID TYPE	1				1		
PSYCHONEUROSES (1) ANXIETY NEUROSIS SEVERE WITH CACHEXIA	1						
PARANOID CONDITIONS 2 CASES		1			1		
MENTAL DEFICIENCY WITH AGIT. DEPR. PSYCHOSIS		1					
TOTALS	11	8	5	18	12	1	2
	24			31			
	41			13			

TABLE I

being sufficiently improved to be sent home to their families (24 of 57 patients in our series); 15-20% of the remainder in the various series were sufficiently improved to be able to take on odd jobs in the institution; 30-35% were unimproved 12 of 57 in our series); and not more than 1-3% were said to have been made worse (1 of 57 in our group).

The incidence of epilepsy following frontal lobotomy has been reported to vary from 10-14%, (Scoville(9), Freeman and Watts(10), and Columbia-Greystone Associates(11). To date we have encountered this complication in 3 of the 57 patients.

II. *Epilepsy Project*

All patients in the institution and a few outpatients who suffered from convulsive disorders or sudden outbursts of abnormal behavior were referred by the Psychiatric Staff to the Neuro-Surgical Unit for evaluation. Neurologic, psychiatric and psychometric studies were supplemented by electroencephalographic and pneumoencephalographic examinations, in order to clarify the diagnosis.

If no evidence of focal epilepsy could be obtained on the basis of the seizure pattern or other studies, the patient was then managed subsequently on drugs and general measures.

Surgical therapy was considered in patients with clinical and laboratory evidence of focal epilepsy if intensive medical therapy failed, and provided some degree of social and economic rehabilitation could be expected if the seizures could be stopped by surgical means. The indications and contra-indications for surgical therapy in epilepsy must be strict in order to obtain successful results. (Penfield and Erickson(12), Walker(13), and Green(14).

Excisions of meningo-cortical scars have been made in the treatment of focal epilepsy since the era of modern neuro-surgery, beginning with Sir Victor Horsely in 1886(15). In carefully selected patients, the seizures have been eliminated in nearly one half of the reported cases (Penfield and Erickson(12) and Penfield and Steelman(16). Since the development of electrocorticography the role of the scar in the production of epilepsy has been emphasized less, and that of the adjacent pathologic cortex recognized (Walker (17), Penfield(18), thus leading to wider cortical excisions. The work of Fuster, Gibbs and Gibbs(19) suggesting that "psychomotor" seizures may be focal in the anterior portion of the temporal lobe led to the surgical treatment of psychomotor epilepsy (Bailey and Gibbs(20)(21), thereby extending the therapeutic armamentarium to this group of patients. Our project, aided by Drs. Bailey and Gibbs, represents the first carefully controlled series of focal epileptics of psychomotor type treated surgically in a state mental institution.

Between July 6, 1948 and August 6, 1951, twenty seven patients with focal epilepsy were treated by neuro-surgical means. It is of unusual interest that 23 of these patients suffered from Focal Epilepsy of Psychomotor Type, with temporal lobe disorders, and only 4 had focal abnormalities of other types. These four patients suffered from Jacksonian Epilepsy of frontal lobe origin. This disproportion indicates the role of the temporal lobe in the psychiatric disorders associated with epilepsy.

Surgical Technique: Utilizing Sodium Pentothal anaesthesia, supplemented by 1¼% Procaine infiltration of the scalp, an osteoplastic craniotomy was done in order to expose the general area of the cerebral cortex which contained the epileptogenic focus. This focus could usually be well delineated by means of electrocorticog-

raphy, supplemented by the use of electrical stimulation. Cortical excision, by subpial dissection methods, was completed, and electrical studies were then repeated to determine the adequacy of the removal of the epileptogenic focus.

Results of Cortical Excisions for Focal Epilepsy: Twenty seven patients have now been studied by us from nine to forty six months following surgery. Evaluation of results in each case was based on a combination of social adjustment, ability to work, psychiatric status, and the degree of relief from seizures.

Sixteen patients were improved to the point that they have been discharged from the hospital and are now living at home. Eight of these are independent and self-supporting, four are partially self-supporting, and four require care and observation at home, and are occasionally readmitted to the hospital for periods of observation.

Eleven of the patients have remained in the hospital, with the majority (seven) becoming improved to the degree that they are some help on the wards, three were unimproved, and one expired 28 months following surgery of pneumonitis, after having been improved.

Thus, 23 patients can be said to have been improved in varying degrees, with 16 home, and 7 in the hospital in this category.

Detailed data regarding these patients are available in our previous publications (Green, Duisberg, and McGrath(22)(23), and Bailey, Green, Amador, and Gibbs(24).

Table II is an outline of clinical results according to diagnostic categories.

RESULTS OF CORTICAL EXCISIONS
FOR FOCAL EPILEPSY
27 PATIENTS, DURING 9-46 MONTHS

DIAGNOSIS	AT HOME			IN HOSPITAL			DEAD
	UNDER	PARTLY UNDER	DEPEND	IMPR.	UNIMPR.	WORSE	
TEMPORAL LOBE (PSYCHOMOTOR EPILEPSY) 23 CASES	8	3	1	7	3	0	1
FRONTAL LOBE (JACKSONIAN EPILEPSY) 4 CASES	0	1	3	0	0	0	0
TOTALS	8	4	4	7	3	0	
	16			10			1
	23			3			

TABLE II

III. *Miscellaneous Neuro-Surgical Problems*

Five patients have been investigated because of the tenative diagnosis of *"Brain Tumor"*. Encephalopathy of undetermined origin was present in 3 of these patients, neoplasm being ruled out on the basis of normal ventriculograms and carotid arteriograms. One patient proved to have a *medulloblastoma* within the fourth ventricle, arising from the vermis of the cerebellum. This tumor was incompletely removed on May 28, 1951. He is still symptom free eleven months later and is working, but the ultimate prognosis is poor. The fifth patient proved to have a *glioblastoma multiforme* within the left frontal lobe. This tumor was incompletely removed on October 24, 1951. The patient continues to have his symptoms of mental deficit and is receiving medical care in the East at the present time.

The final patient to be reported, our 84th craniotomy, was referred from Yuma, Arizona, in a nearly terminal state. An osteopathic neurosurgeon in Los Angeles had turned down a bone flap of skull to remove a suspected intra-cranial hematoma, and was unable to make a closure, thereby allowing herniation of the left hemisphere of the brain, with secondary paralysis of the right side of the body and loss of speech. The cerebral fungus was removed, but because of infection and the poor condition of the patient, death occurred in his home several months later.

Summary

The operative phase of the diagnostic and therapeutic program of the Neuro-Surgical Unit of the Arizona State Hospital in relationship to the effect on rehabilitation of otherwise unmanageable institutionalized patients is discussed.

One hundred craniotomies were performed between October 13, 1947, and February 7, 1952, or ninety patients without operative mortality. Four patients are now dead of other causes.

Of 57 psychotic patients who were treated with orbitofrontal lobotomy, 24 are home (11 working and independent, 8 partially indepen-

dent, 15 dependent), 31 remain in the institution (18 improved, 12 unimproved, 1 worse), and 2 are dead.

Of 27 patients with focal epilepsy, treated by cortical excision, 16 are home (8 working and independent, 4 partially independent, and 4 dependent), 10 remain in the institution (7 improved, 3 unimproved), and 1 is dead.

Of six patients who were treated for other conditions, 5 were considered to have brain tumors, and 1 had a cerebral fungus following a craniotomy done outside of Arizona. Two malignant cerebral neoplasms were treated operatively (1 patient is still independent and working, and the other is in a hospital in the East); the remaining three patients in whom brain tumor was suspected are at home, special studies having shown no evidence of neoplasm. The cerebral fungus (herniation) was repaired, but was so extensive that the patient ultimately expired in his home. Table III.

NEURO-SURGERY --- ARIZONA STATE HOSPITAL
100 CRANIOTOMIES, 90 PATIENTS, 4-55 MONTHS
NO OPERATIVE MORTALITY

PSYCHO-SURGERY (ORBITOFRONTAL LOBOTOMY)	--- 57 PATIENTS
CORTICAL EXCISIONS (FOCAL EPILEPSY)	--- 27 PATIENTS
MISCELLANEOUS, INCL. 2 BRAIN TUMORS	--- 6 PATIENTS

45 HOME		41 IN HOSPITAL			4 DEAD
INDEPENDENT	PARTLY INDEP.	DEPENDENT	IMPROVED	UNIMPROVED	WORSE
20	14	11	24	15	1

ANNUAL AVERAGE COST FOR 1 INSTITUTIONALIZED PATIENT = $1,000.00
FUTURE SAVINGS EACH YEAR RESULTING FROM THESE PROJECTS = $45,000.00

TABLE III

Conclusions

The projects as outlined above have been productive from the standpoint of clinical research of otherwise unrehabilitable patients in a state mental institution, thus providing a definite means of treatment. The results of neurosurgery of this type have enabled 45 of the patients to leave the hospital and to be at home (20 are independent, 14 are partially independent, 11 are dependent). Of the 41 patients still residing in the institution, 24 have been improved, 15 unimproved and 1 is worse.

The economic aspects of being able to discharge patients from a state institution are as important to the state and is taxpayers as to the patient and his family. The average cost of one thousands dollars a year to care for an institutionalized person goes on year after year. Thus, the forty five patients who now have left the institution represent not only a saving for the state of approximately $45,000.00 for each subsequent year but also a measure of humuanitarian and scientific advance.

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PHOENIX Clinical CLUB

MASSACHUSETTS GENERAL HOSPITAL CASE NO. 36271

The Case History in this discussion is selected from the Case Records of the Massachusetts General Hospital, and reprinted from the New England Journal of Medicine. The discussant under Differential Diagnosis is a member of the staff of the Massachusetts General Hospital. The other discussants are members of the Phoenix Clinical Club.

First admission. A thirty-seven-year-old housewife was admitted to the hospital for repair of a cystocele and lacerated cervix. She had had seven pregnancies, which were followed by normal lactation. Severe hemorrhage followed a dilatation and curettage and routine plastic repair, and six days after the plastic repair the cervix was amputated. The patient was discharged in good condition on the twenty-fifth hospital day.

Second admission (twenty years later). The patient had a spontaneous normal menopause at the age of forty-five. She had always had a somewhat withdrawn personality, but at about the age of fifty-four she began to spend most of her time in her room. She complained of fatigue and weakness and developed a craving for sweets. For seven weeks before her second admission, she was too weak to do any housework or shopping. Two weeks before admission a series of dental extractions was begun. For six days before entry she refused all food and took only minimal amounts of water. On the morning of admission she was cold, sweaty and totally unresponsive.

Physical examination showed a semicomatose woman with a pulse of 80 and a blood pressure of 120 systolic, 80 diastolic. The lungs were clear, and the abdomen soft without masses. The axillary hair was absent, and the public hair was scanty and of female distribution. The skin was pale, and the face expressionless. No abnormal pigmentation was seen. Knee and ankle jerks were absent. The blood sugar was 50 mg. per 100 cc. The patient became active and oriented immediately after an infusion of 10 per cent dextrose in saline solution.

Urine obtained after this infusion had a specific gravity of 1.018, with occasional red and white cells in the sediment. There were a+ test for albumin, a red sugar reaction and a++ test for acetone. Examination of the blood showed a red-cell count of 3,680,000, with 10.5 gm. per 100 cc. of hemoglobin, and a white-cell count of 11,400, with 91 per cent neutrophils. The nonprotein nitrogen was 19 mg., the protein 5.3 gm., and the cholesterol 236 mg. per 100 cc. and the chloride 92 milliequiv., the sodium 117 milliequiv., and the potassium 4.45 milliequiv. per litter. Corticosteroid excretion was 0.04 mg. in twenty-four hours. No 17-ketosteroids were detectable. Follicle-stimulating hormone (FSH) excretion was positive for 52 mouse units in twenty-four hours. Films of the skull were normal. X-ray examination of the chest showed a small heart and some calcification in the left hilar region and mediastinum. Plain films of the abdomen were negative. The basal metabolic rate was −8 per cent on one determination. An electrocardiogram showed a normal rhythm of 35, very small QRS waves in the limb leads, very low T waves in Lead 1 with slight late dip, inverted T waves Leads 2 and 3 and a prolonged systole measured by a QT interval of about 0.45 second.

The patient responded well to intravenous fluids and electrolytes, desoxycorticosterone acetate (DOCA), adrenocortical extract and testosterone. She was discharged after twenty-six days of hospitalization on a regime of DOCA, thyroid and added salt.

Third admission (three and a half years later). In the course of the next three years several minor crises were precipitated by upper respiratory infections, gastrointestinal upsets and an abscessed tooth, but all were treated sucessfully at home with increased amounts of DOCA and saline solution. During this period the patient developed progressive contracture of both knee joints. This admission was preceded by a brief period of confusion and one bout of vomiting after which she went into stupor. Physical examination showed a restless, disoriented woman with a hacking cough and temperature of 103.6° F. The systolic blood pressure was 85, and the diastolic was not obtainable. The lungs were clear, and the abdomen soft. Urinalysis was negative except for a few red cells and casts in the sediment. Examination of the blood revealed

a hemoglobin of 12.5 gm. and a white-cell count of 12,500, with 80 per cent neutrophils. The sodium on admission was 136.2 milliequiv., the potassium 4.6 milliequiv., and the chloride 103 milliequiv. per liter, and the sugar 109 mg., the nonprotein nitrogen 25 mg., and the cholesterol 174 mg. per 100 cc. Urine culture was negative. FSH excretion was positive for 13 mouse units in twenty-four hours. X-ray examination of the chest showed a density in the right middle lobe consistent with an infarct. Films of the pelvis disclosed degenerative changes about the right hip joint and around the symphysis pubis. The patient responded satisfactorily to penicillin, intravenous administration of dextrose in saline solution, DOCA and lipoadrenal and aqueous adrenocortical extract and was discharged after nine days on DOAC, methyl testosterone and sodium chloride.

Fourth admission (seven months later). The patient did moderately well until two days prior to admission, when she developed coryza followed by drowsiness, vagueness, thirst, anorexia and vomiting. Physical examination revealed a temperature of 98.6°F., a pulse of 88, respirations of 20 and a blood pressure of 98 systolic, 60 diastolic. There was a hacking cough productive of thick, white sputum, but the examination was otherwise negative. The blood sugar was 69 mg. per 100 cc., and the sodium 126 millequiv., and the potassium 4.7 milliequiv. per liter. An electrocardiogram showed essentially the same pattern as the previous tracings except that the QT interval had decreased to 0.34 second. The patient was given Crysticillin and the usual hormone therapy and was discharged improved on the seventh hospital day on increased dosage of DOCA and additional salt.

Final admission (two and a half months later). She did well until two weeks before the final admission, when she became drowsy and appeared to have deteriorated mentally. The blood pressure at this time was 90 systolic, 70 diastolic, and the sodium 127 milliequiv., per liter. She was thought to have been swallowing her DOAC tablets instead of taking them sublingually. She improved on intramuscular medication and increased salt (6.0 gm. a day for four days). She then developed edema, and salt and DOAC were omitted for three days. Six days before admission she had many visitors and complained of fatigue. On the following day she had an episode of fainting relieved by 10 cc. of 50 per cent glucose intravenously. The blood pressure was 120 systolic, 80 diastolic, and no DOCA was given, since edema persisted. Two days before admission the blood sugar was 52 mg. per 100 cc., and the serum sodium 117 milliequiv. per liter. On the following day she refused food and was given 500 cc. of 10 per cent dextrose in saline solution intravenously and 2 mg. of DOCA, and was placed on 1 cc. of lipoadrenal extract every eight hours. She improved, and ate well the rest of the day. On the morning of admission she vomited and was very drowsy.

Physical examination revealed a semicomatose woman with a temperature of 99.1° F., a pulse of 72, and respirations of 20. The blood pressure was 92 systolic, 60 diastolic. The right pupil was larger than the left, all extremities were somewhat spastic, abdominal reflexes, knee jerks and ankle jerks were absent, and there were bilateral Babinski reflexes.

The urine had a specific gravity of 1.026 and gave a++ test for albumin, a mustard-colored sugar reaction and a +++ test for acteone. The blood sugar was 121 mg., and the total protein 5.0 gm. per 100 cc., and the sodium 111 milliequiv., the postassium 4.2 milliequiv., and the chloride 82 milliequiv. per liter. The nonprotein nitrogen was 11 mg., and the blood urea nitrogen 3.8 per 100 cc. (both these values were checked). An elctrocardiogram showed a rate of 80 with a PR interval of 0.18 second. There was low voltage in all complexes of Lead 1 and of the QRS complexes throughout. The QT interval was 0.46 second. The T waves were up right in Leads AVR and AVL, flat in Leads 1 and V6, upright to inverted in Lead V3 and inverted in Leads 2, 3, AVF, V4 and V5, with low voltages in all Leads except V6.

In the twenty-two hours of the hospital course the patient received 2000 cc. of 10 per cent dextrose in saline solution, 300 cc. of physiologic saline solution and 700 cc. of 5 per cent dextrose in water, all intravenously, 140 cc. of aqueous adrenocortical extract intravenously and 10 cc. intramuscularly and 300,000 units of penicillin. The urinary output during this period was 575 cc. On the evening the first hospital day occasional ventricular premature beats were heard and moderate Cheyne-Stokes breathing began. Soon runs of 8 to 16 rapid beats appeared, and multifocal ventricular tachycardia was demonstrated by electrocariogram. During the episodes of tachycardia the respirations became deep and

stertorous, the eyes rolled up, and the patient became rigid without convulsive movements. Quinidine lactate, 0.05 gm., was given cautiously intramuscularly. The patient remained comatose throughout the night and the blood pressure ranged around 100 systolic, 60 diastolic. Twenty-one hours after admission she stopped breathing, and no heart sounds, pulse or blood pressure could be obtained. Then grunting respirations were noted at intervals of about forty seconds. One cubic centimeter of intracardiac epinephrine produced no change, and oxygen and artificial respiration were started. Electrocardiograms showed absent P waves and bizarre QRS complexes of 0.14 second's duration occurring irregularly with periods of asystole lasting up to 10 seconds and runs of ventricular tachycardia at 165 seconds. A mixture of coramine with caffeine sodium benzoate was given intracutaneously followed by 0.5 cc. of 20 per cent potassium chloride intracutaneously without improvement. Later 1 cc. of 20 per cent potassium chloride was given by vein, also without improvement. About forty-five minutes after the episode started the electrocardiogram showed only a few bizarre ventricular complexes, and then no evidence of heart action. The patient became cyanotic, and was pronounced dead.

KENT THAYER, M.D.

The first admission of this patient we will discard except to say she evidently had normally functioning endocrine glands.

At the age of 57 a diagnosis is made of Addison's disease for the following reasons,—(1) withdrawn personality is frequent in Addisonians. They have a diminution of intellect, loss of memory, apathy and depression. This is of utmost clinical significance in Addisonians for in about 70% of them a change of mood is one of the earliest signs of impending collapse or crisis. (2) Weakness and fatigue is usually a dominant symptom. (3) Loss of appetite even to the point of nausea and vomiting is characteristic, and when nausea or vomiting occurs crisis is near. (4) It is well known that any trauma, mental or physical is withstood poorly by Addisonians. This patient was finally thrown into crisis by dental extractions.

On admission a B.P. of 128/80 was found. This is somewhat against the text book picture, but is not too infrequent. The scanty axillary and pubic hair is characteristic and makes one consider either adrenal or pituitary insufficiency, or both. Our patient evidently had little pituitary disorder since there were 52 monometer of F.S.H., but the adrenal activity was very low with no 17 Ketosteroids being execreted. Pigmentation is present in 80 to 90% of Addisonians. This patient had none. Fasting blood sugar is low in crisis and glucose tolerance curve in Addisons is flat. It has been shown there is faulty absorption of sugar from the intestinal tract and also faulty utilization of glucose by the tissues and failure of storage of glycogen in the muscles and liver. Our patient on admission had blood sugar of 50 mg/100 cc. The urine usually is not of high specific gravity and our patient had 1.018 which is usual. However on later admission the specific gravity went to 1.027.

The sugar in the urine was due to the infusion of glucose.

Usually a patient in crisis has an elevated N.P.N. and urea nitrogen. I am unable to explain an N.P.N. of 19 and on later admission an N.P.N. of 11 and urea nitrogen of 3.8 unless it was due to malnutrition or liver disease.

It is usual for the serum sodium and chloride to be diminished and the decrease of sodium is a more reliable index than chlorides. However occasionally serum sodium is normal. Our patient had decreased sodium and chlorides on most admissions. Theoretically the serum potassium is elevated in crisis and decreases under adequate therapy. However this is not a reliable index, for many times this value is normal even when the sodium is extremely low.

The B.M.R. of –8, I believe means very little. Addisonians usually have –10 or lower which does not necessarily mean the thyroid is involved. The E.K.G. on admission is confusing. With a rate of 35 the QT interval every 45 sec. is too short and I believe there is a mistake in rate. If the 3 in 35 was supposed to be an 8, (since on admission the patient had a heart rate of 80) the QT interval is prolonged. The small QRS and inverted T in 2 and 3 is compatible with Addison Disease. There has been considerable discussion as to these change. Experimentally increased potassium will cause increased conduction time with high T waves. In hypokalemia there is evidence of intra ventricular block with inverted or flat T waves, and prolonged QT interval. These findings are common after treatment with Doca.

The thing that clinches the diagnosis is the

fact the patient responded promptly to specific therapy.

The next admissions of the patient seem to confirm our diagnosis. The patient had minor and major crises due to respiratory infections and dental infections.

Whether on the third admission this patient had an infarct in the lung or pneumonia, I do not know. The progressive contracture of the knees I am unable to explain unless it was due to position of keeping the knees flexed while at rest. The patient responded well to treatment on the third and fourth admission being discharged in 9 and 7 days respectively.

The final admission, which was 4 years, 3½ months after diagnosis of Addison's Disease, was rather characteristic with mental changes, weakness, low B. P., and slight lowered sodium and low blood sugar. The patient had been maintained on Doca and salt and developed edema, so these were discontinued, and the patient given glucose.

Doca is effective in only one phase of adrenal cortical failure and that is electrolyte balance, and has no effect on carbohydrate and protein metabolism. A severe Addisonian in crisis usually requires more than Doca to bring about a satisfactory response—that is adrenal cortical extract. This was given to our patient for one day and stopped. During that time she improved and then became drowsy and comatose. The neurological findings are suggestive of an intracranial lesion, probably vascular and I would suspect she had a right cerebral thrombosis. However, Sorkin states, "an increase in musclar tone is often present in adrenocortical insufficiency. This is sometimes associated with muscular rigidity, and pyramidal tract signs."

The EKG on this admission I believe is compatable with hypokalemia.

Potassium may be lost due to several causes—one of the most frequent causes is inability to eat followed by dehydration and then replacement with potassium free fluids, especially if there is abnormal gastrointestinal losses due to vomiting, diarrhea or suction. Another cause is transfer of K from inter celluler spaces to cells, such as occurs in diabetic acidosis with treatment with insulin. The potassium is utilized in the metabolism of glucose and is fixed in the cells, leaving a low serum potassium.

Administration of Doca as adrenal cortical extract or Cortisone causes an accelerated renal excretion of potassium. No mention of potassium containing fluids being given our patient is made until she was practically dead. Evidently they were going by the serum potassium level, which as said before is misleading. The EKG changes are probably the earliest evidence of hypokalemia. These changes may occur in other cardiac conditions, so must be interpreted according to the condition of the patient.

Patients treated with Doca over a long period of time may develop focal myocardial necrosis. This was found in 7 of 8 cases in one series treated with Doca and more in 11 cases who died before Doca was used. These same changes of focal myocardial necrosis can be produced in animals either by potassium deprivation or by excessive use of Doca.

My diagnosis: Addison's disease with crisis, and Hypokalemia.

GEORGE McKHANN, M.D.:

THE CASE OF THE SALTED LADY

This case puts me in mind of the man who had a bear by the tail, only this bear has so many tails. I tried to get Dr. Thayer to hold some of them while I held others, but no luck.

Miners speak of an artificially enriched gold mine as "salted." This case is full of the problems of salt. So the title this time is, "The Case of the Salted Lady." I believe Judge Dysart will agree that is one of the important points of this case. Never have I spent so many hours,—so very profitably—as on this case.

My last case lacked laboratory work-up, but this one kept the labs busy for years. Even to repeat their reports would occupy all of my allotted time, so I have attempted to tabulate the reports to save time. In table 1, attention is called to the very low NPN and urea, for which I can offer no explanation, to the absence of 17-ketosteroids, which if correct, indicates pituitary hypo-function, and to the chlorides, sodium, potassium, and to the sodium potassium ratio.

Obviously her attending physicians believed that she had Addison's Disease. They treated her successfully for that for over four years. With them I shall agree.

The symptoms of Adrenal Cortical Insufficiency are weakness, easy fatigability, abnormal pigmentation, weight loss and dehydration, hypotension and small heart size, anorexia, nausea, vomiting, diarrhea, dizziness and syncopal attacks, nervous and mental symptoms,

TABLE I

	Age in years	57	60½	61 1/12	61 7/24
	Hospital Admission	2nd	3rd	4th	5th
	Hospital Days	26	9	7	22 hours
Normal	Test				
20-40mg per 100cc	NPN	19	25		11
10-15mg. per 100cc	Urea				3.8
80-120mg. per 100 cc	Blood sugar	50	109	69	52
					120
130-240mg. per 100cc	Cholesterol	236	174		
6-8Gm. per 100cc	Protein	5.3			5
−10 to Plus 10	BMR	−8			
	Hematocrit				
Males 45%					
Females 43%					
0.2 to 2mg in 24 h.	Urinary corticosteroids	0.04			
Female: 5-12mg. in 24 h. mean 10mg.	Urinary 17-Ketosteroids	0			
Male: 8-23mg. Mean 15mg.					
Female: 5-100 mouse units in 24 h.	FSH	52	13		
Male: 5-30					
107 m.Eq. per liter	Serum Cl	92	103		82
142 m.Eq. per liter	Serum Na	117	136.2	126	127
					111
4-5.4 m.Eq. per liter	Serum K	4.45	4.6	4.7	4.2
32	Na/K Ratio	26.1	29.6	26.8	30.2
					26.4

changes in gonadal function and secondary sex characteristics, abdominal pain, constipation, salt craving, muscle pains, and symptoms of spontaneous hypoglycemia, such as hunger, headache, weakness, loss of initiative, sweating, trembling, emotional instability, negativism, dilated pupils, blurring of vision, diplopia, circumoral pallor, full pulse, irregular, shallow breathing, apprehension, disorientation, and unconsciousness with or without convulsions. These signs of hypoglycemia may appear with a blood sugar of 60 mg. per 100 cc.

The laboratory findings in adrenal cortical insufficiency are decreased serum sodium and chloride concentration, increased serum potassium and NPN (the increased NPN is due to renal failure), increased urinary sodium and chlorides and decreased urinary potassium, hypoglycemia and a flat oral glucose tolerance curve, hemoconcentration, decreased plasma and blood volume, low urinary 17-ketosteroid and corticoid excretion, small heart size on X-ray, low basal metabolic rate, abnormal electrocardiogram, abnormal electroencephalogram, X-ray demonstration of healed or active tuberculosis, increase in circulating lymphocytes, normal or high levels of circulating eosinophils, increased blood oxygen capacity, increased insulin sensitivity.

Today the diagnosis would have been confirmed by the epinephrine test for anterior pituitary adrenocortical integrity, by the ACTH test for adrenocortical reserve function, by the Robinson-Kepler-Power water test, and perhaps further proven by the induction of hypoclycemia, and the Cutler-Power-Wilder test of restricting sodium and chloride intake and increasing potassium and fluid intake. She certainly had ample proof of the response to therapeutic doses of desoxycorticosterone acetate, DOCA.

The differential diagnosis of adrenal cortical insufficiency includes neurasthenia, chronic infections such as tuberculosis and brucellosis, chronic intestinal disease, myasthenia gravis and chronic thyrotoxic myopathy, renal insufficiency of the salt losing type, hyperparathyroidism, and spontaneous hypoglycemia.

Symptoms, signs, and laboratory findings of adrenal cortical insufficiency our patient had. Her course might almost be said to be classical, including the progressive contractures of both knee joints on treatment, the paralyses, and the recurrent crises following infection and trauma.

I am reminded that we in Arizona should be

TABLE II

THE EFFECTS OF POTASSIUM ON THE ELECTROCARDIOGRAM

Barring cardiac disease the electrocardiogram is normal with a normal serum potassium. Normal serum potassium ranges from 4 to 5.4 milliequivalents per liter, or 16 to 21 mg. per 100cc.

Hypopotassemia causes these changes in the electrocardiogram, in a relatively progressive manner depending on the degree.

1. Prolonged QT with a broad T wave.
2. Lowering or inversion of T.
3. Depressed S-T at about 1.5 milliequivalents.
4. Occasionally a prolonged P-R, and a U-wave may appear. Myodegeneration and pulmonary congestion occur at this stage.

Hyperpotassemia causes changes that are somewhat the reverse of those caused by hypopotassemia.

1. Tall, peaked T waves at about 7.8 milliequivalents.
2. Lower R waves.
3. Absent P waves.
4. Prolonged QRS.
5. Depressed S-T.
6. Biphasic QRS and T waves with death near, and the serum potassium at or above 10 milliequivalents.

Other myocardial disease may complicate these patterns and limit their usefulness.

unusually alert for such cases by a recent autopsy. This man had had tuberculosis of the lungs nearly thirty years ago, and died recently of other causes. At autopsy the pulmonary scars were difficult to find, but both adrenals contained several tuberculomas as large as one centimeter in diameter.

The treatment of chronic adrenal cortical insufficiency involves replacement of the deficient hormones so far as possible. This may be done by using aqueous adrenal cortex extract, or the lipo-adrenal cortex, but these are very expensive. So DOCA has been used in the past. DOCA has regulated salt metabolism and thus prolonged life, but has not always returned the patient to a normal state as regards energy, because of the failure to improve carbohydrate and protein metabolism. Today the use of cortisone adds another weapon to our armamentarium,—a weapon which was not available to our patient. Its use would have simplified the treatment. One does wonder about the use of cortisone in tuberculosis of the adrenals.

On her last admission she developed evidence of recurrent lack of cortical hormone, probably because she had been swallowing her DOCA. She also showed evidence of neurological lesions which at her age may have been arterio-sclerotic cerebro-vascular lesions, but much more likely were due to a relative hypokalemia with paralysis similar to that seen in familial periodic paralysis, for such does develop in adrenal cases. Or she may have had both arterio-sclerosis of the cerebral vessels and hypopotassemia, and also some disease of the pituitary gland.

The first electrocardiogram of her final admission was consistent with a low serum potassium with S-T-T wave changes and a QT ratio of 1.31, much prolonged. Or else she had both anterior and posterior wall myocardial ischemia, or damage. Such myodegeneration may occur with a very low serum potassium, and leave irreversible changes and even scars.

She was given saline and dextrose to a total of 3000 cc plus 140 cc of aqueous adrenal cortical extract in 22 hours with the excretion of only 575 cc of urine. This was evidence of renal failure.

The normal serum potassium is about 4.5 m.Eq. per liter, but the normal intra-cellular potassium is 115 m.Eq. per liter, which is about 23 times that of the serum. The metabolic balance between these two is very delicate, and shifts may occure quite rapidly. The serum potassium may be increased by increased intake of potassium, oliguria and anuria, tissue breakdown or anoxia, contraction of extra-cellular volume by dehydration, and adrenal cortical deficiency. Exercise, anoxia, and agonal states will send potassium out of the cells, probably due to injury to the cells, into the serum. Several of these factors were present terminally in our patient.

The agonal state and the anoxia dumped intracellular potassium into the blood. The renal failure prevented its excretion, resulting in hyperpotassemia, and cardiac poisoning by the potassium, as evidenced by the ventricular ectopics, absent P-waves, bizarre QRS' of 0.14 second duration with periods of asystole, and finally ventricular tachycardia and fibrillation. Accord-

ing to the last electrocardiogram the serum potassium must have been close to or above 10 m.Eq. per liter. Death results at about that level. Of course a coronary occlusion might also have been responsible for that last electrocardiogram. So a coronary occlusion may be the "nigger in the wood pile." But she had no pain suggestive of such.

She was given Coramine and Caffiene Sodium Benzoate, and of all things with these electrocardiographic findings (which are quite consistent with the last stages of cardiac potassium poisoning), 0.5 cc of potassium chloride 20% solution intra-cutaneously and then 1 cc of 20% potassium chloride I.V., a total dose of 300 mg., but with no improvement. Estimating her extracellular fluid volume at 14 liters (it probably was less), this dose added about 0.7 m.Eq. per liter. Then the electrocardiogram showed only a few bizarre ventricular complexes, then after 45 minutes the heart stoped, cyanosis appeared, and ..... She died of Potassium Poisoning of her myocardium. The last medication assured her death. Better to have given her oxygen, glucose but no saline, plasma, blood, cortisone, and adrenalin which might have transferred extracellular potasium into the cells, or re-established renal function to aid its excretion.

My diagnosis is Chronic Adrenal Cortical Deficiency with death due to Potassium Poisoning as proven by the last electrocardiogram. As a weak hedge, I would name as second choice arterio-sclerosis, coronary disease with coronary occlusion as the actual cause of death in a patient suffering from Chronic Adrenal Cortical Deficiency.

Dr. J. H. Means*: This is the case of a woman with a chronic malady, which I am sure was mainly one of insufficiency of the adrenal cortex and was characterized by a series of episodes that seemed to be fairly classic Addisonian crises and finally a fatal one. The problem, as I see it, is not whether she had adrenocortical insufficiency but rather what kind it was, whether it was primary or secondary, what it was due to and what else if anything she had.

I shall comment on certain items in the record first. At the age of fifty-four, seventeen years after the first admission, the patient apparently had a personality change. She developed a craving for sweets, which I suppose may have been a symptom of hypoglycemia. About two weeks before the second addmission, she had a series of dental extractions, which in any patient who has insufficient adrenocortical function might precipitate a crisis. On the morning of that admission she had an episode similar to the crises seen in patients who have proved adrenal insufficiency. At that time there was a slight leukocytosis. The fact that the urine contained sugar may have been connected with the infusion of dextrose; I cannot explain the acetone. The low corticosteroid secretion and absence of 17- ketosteroids were both strongly in favor of practically no adrenocortical function. FSH excretion was suggestively high; electrocardiographic findings were similar to those seen in hypothyroidism or hypoadrenal function. There was a small heart, which is a characteristic finding in Addison's disease. The normal blood pressure is a little troublesome from the point of view of my theory.

At the third admission the FSH was 13 mouse units in twenty-four hours, which Dr. Albright tells me is not low. That is very important. There was x-ray evidence of a pulmonary infarct, but nothing in the history suggesting the legs as a source, although they are often involved.

Could we see the x-ray films?

Dr. Stanley M. Wyman: These are the original films, showing clear lungs; the heart shadow appears to be well within normal limits.

Dr. Means: You mean it is not larger than normal. Do you think it is smaller than normal?

Dr. Wyman: I am very hesitant to say that.

Dr. Means: What about the sella turcica?

Dr. Wyman: The sella turcica seems normal; the clinoid processes show no erosion, and there are no abnormal calcifications in the region. On films taken a few days after the original chest films, the heart appears a little larger. A shadow in the right lung is seen overlying the right hilus and appears to lie well forward in the chest. It is perfectly consistent with an infarct or with atelectasis. There is no evidence of calcification above the kidneys in the region of the adrenal glands.

I do not think there is anything of importance about the degenerative changes reported in the hip joints and symphysis other than those we commonly encounter.

Dr. Means: Thank you very much. I might just point out in my defense that some other radiologist must have called this a small heart. Just to stick my neck out a little farther, I am

*Chief, Medical Service, Massachusetts General Hospital.

going to guess that the heart weighed less than normal.

During the last admission the patient had albuminuria, but I do not believe she had any important renal lesion. Tests for sugar and acetone were positive in the urine, and the blood sugar was somewhat high so that one wonders if there were bizarre electrocardiographic changes, and I should like to have an electrocardiographer tell us what light these changes throw on the electrocardiogram.

Dr. James H. Currens: The electrocardiogram during the last admission was very bizarre. It was my impression that it was consistent with but not necessarily diagnostic of a deficiency of intracellular potassium. The electrical systole as manifested by the QT interval was prolonged, and there was significant depression of the RST segments as well as the T waves. The QRS interval was also increased. I should like to point out the fact that somewhat similar changes in the electrocardiogram have been noted in rats dying as a result of potassium deficiency—that is, in animals maintained on a potassium-deficient diet. The normal serum potassium is not necessarily disturbing since correlation between electrocariographic changes and serum potassium levels is nil at times.

Dr. Means: I shall say this for my diagnosis, that the chief factor was adrenocortical insufficiency and the chief differential diagnosis, it seems to me is between Addison's disease and Simmond's disease or its subspecies, Sheehan's disease. One wonders about the significance of that hemorrhage after dilatation and curettage. Sheehan's disease is found in women who have severe post-partum hemorrhage followed by infarction of the pituitary body and panhypopituitarism. This patient did not have a post-partum hemorrhage but a hemorrhage from the uterus after a dilatation and curettage. Sheehan[1], in his paper, makes no mention of this type of syndrome developing after any hemorrhage other than post-partum hemorrhage. Several years later the patient had a perfectly normal menopause, which practically rules out Simmond's syndrome. However, to my way of thinking, the absence of pigmentation favors a diagnosis of adrenocortical insufficiency secondary to pituitary failure. In primary Addison's disease pigmentation occurs in over 95 per cent of the cases, and there is probably a higher incidence in fatal cases. Of course there are panhypopituitarisms other than Simmond's disease, such as those caused by a tumor impinging on the pituitary body or any of the other things that may destroy the pituitary body or reduce its function. Since there is no evidence of a pituitary lesion, however, I am very skeptical about a primary pituitary source for this syndrome.

There was only one determination of the basal meabolic rate, which was –8 per cent. Dr. George Thorn tells me that in most cases of classic Addison's disease, the basal metabolic rate is around –20 per cent. One would expect an even lower rate in Simmond's disease. Of course, one test is not very important.

The normal to high FSH, it seems to me, practically excludes hypofunction of the pituitary body; therefore, I am forced to say that this was primary Addison's disease and I do not know why there was no pigmentation. If it was primary Addison's disease, which kind was it? Was it primary atrophy or tuberculosis of the adrenal glands? I do not believe there is very much in the record to suggest tuberculosis,—the x-ray films do not show any,—so that I would favor the atrophic variety of Addison's disease.

Now the question arises, were there any other endocrinopathies here? I just do not know about the thyroid gland. Thyroid was given to the patient so she was considered to have been mildly hypothyroid. There is nothing that I can see that would justify my saying that she had any hypothyroidism. Toward the end there was a little flock of items that suggested that she might be getting diabetic but I cannot really say that she was. I think that Dr. Mallory found atrophic to absent adrenal glands, a normal pituitary body and probably a normal thyroid gland. I cannot say that he found anything else except a small heart. I think that is as far as I can go.

Dr. Reed Harwood: I would like to add to the information in the record that she did look like a patient with myxedema.

Dr. Means: Why should she have had my myxedema with Addison's disease? She should not. She may very well have had myxedema with Simmon's diseases, of course. Yet I cannot for the life of me see how she could have had Simmonds's disease with this normal menstrual story, normal menopause and the normal to elevated FSH secretion. It just does not make sense as far as my meager knowledge goes.

Dr. Harwood: I would like to point out that

the patient went four years without any hyopglycemia, and then it gave her quite a little trouble during the last month of her life. I should like to ask Dr. Albright why it was that she could be brought out of her crises for a long time and then suddenly did not respond at all.

Dr. Means: There might have been some infection, I suppose, that made her more resistant to treatment.

Dr. Fuller Albright: I cannot answer Dr. Harwood's question. This patient belongs to a group of about 5 patient we have seen in whom there were all the symptoms and findings of panhypopituitarism except that the FSH was normal. We rather think that the hormones of the pituitary body except the FSH come from the eosinophil cells. We believe that in these cases there is a lack of eosinophil cells and normal basophils. This is the first autopsy that we have had in any of this group, and we are very anxious to see if the eosinophils have all disappeared.

Dr. Jacob Lerman: I would like to ask Dr. Means if he places any emphasis on the drop in FSH of 52 to 13 mouse units? Does that perchance mean a progressive destruction of the pituitary body? The first one mentioned was 52 mouse units. We assume that the highest positive dilution is recorded.

Dr. Albright: There is no evidence that there was a drop in the FSH titer. The first test was "positive for 52 mouse units per day", and the second was "positive for 13 mouse units per day". The second test was not assayed for 52 mouse units and might have been positive at this level.

Dr. Harwood: I understand myself that the FSH was not quite as strongly positive on the second determination.

Dr. Albright: I did not say that the FSH test was not high; it was not low for the normal mature woman. It may have been low for the postmenopausal woman.

Dr. Means: I am placing a great deal of weight on the FSH. If there is something phony about that, my argument falls to the ground.

Dr. Andries Querido: If this patient really was myxedematous, with Addison's disease, I think one would have to consider biglandular disease with a normal pituitary body. The one such case I have seen was strongly pigmented. I think that the absence of pigmentation may be an argument against a normal pituitary body in this case.

Dr. Frederic C. Barter: I wonder if possibly some of the difference was due to the fact that she was not hypothyroid during the entire time but only during the last months.

Dr. Lerman: Falta (2) has described patients with biglandular disturbance, Addison's disease and myxedema, but in those cases I think, as Dr. Querido said, there was pigmentation.

CLINICAL DIAGNOSIS

Panhypopituitarism.
Addison's Crises.

DR. MEAN'S DIAGNOSIS

Addison's disease, atrophic type.

ANATOMICAL DIAGNOSIS

Atrophy of anterior lobe pituitary body, severe, with hypopituitarism.
Atrophy of thyroid gland and adrenal cortex, secondary.
Alopecia, Axillary.
Pulmonary tuberculosis, apical, bilateral, healed.

PATHOLOGICAL DISCUSSION

Dr. Tracy B. Mallory: Autopsy on this patient showed atrophy of three endocrine organs—the pituitary, the thyroid and the adrenal glands. The pituitary body showed a minute crescent of anterior lobe, perhaps 10 per cent of normal volume, surrounding an apparently normal-sized posterior lobe. Sections of the pituitary gland at autopsy are often very difficult to interpret because of postmortem changes. I thought both eosinophils and basophils were markedly decreased and that the chromophobes made up the bulk of the persisting glandular tissue. Material was sent to Dr. A. E. Severinghaus, of New York City, because of his expert knowledge of pituitary cytology. He agreed that the eosinophils were markedly decreased but believed that there was only a slight reduction in the number of basophils. I have no doubt he is correct, and therefore Dr. Albright can consider his hypothesis vindicated.

The thyroid gland weighed only 5 gm. and showed extensive atrophy and fibrosis and comparatively little inflammation. The two adrenal glands together weighed 5 gm. and were almost paper thin. The medulla was relatively well preserved. The cortex showed very marked atrophy, with almost complete lipoid depletion. There was also extensive fibrosis in the adrenal glands but no evidence of any inflammatory process. In the lungs small scars of old tuber-

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*Hamilton, H. E., and Zavala, D. C.: Amebiasis in Iowa: Diagnosis and Treatment, J. Iowa M. Soc. 42:1 (Jan.) 1952.

SEARLE RESEARCH IN THE SERVICE OF MEDICINE

WHEN WRITING ADVERTISERS PLEASE MENTION THIS JOURNAL

culosis were found at the apexes but nothing active, and there was one fibrotic lesion that was consistent with a healed infarction. The heart was small, weighing 260 gm. That is not extremely small, however, for a small woman.

Dr. Means: It was, however, somewhat small. What was the weight of the pancreas?

Dr. Mallory: The pancreas weighed 60 gm., which is considerably less than normal, but microscopically was not very striking in appearance. One hyalinized island of Langerhans was found. The majority of the islands looked quite normal. There was no fibrosis or fat infiltration.

Dr. Querido: The interesting point here is the question of the etiology of this disease. If one has to stick to the definition of Sheehan, the patient should not have had anterior lobe insufficiency. It might be that this case was similar to those described by Falta2 that have occasionally appeared in the literature. She may have had a multiglandular fibrosis, and the hemorrhage had nothing to do with it. This would be the first case as far as I know studied with modern endocrinologic methods.

Dr. Mallory: One of the difficulties with accepting severe hemorrhage and shock-like states as the etiology of hypopituitarism is the very marked predilection of the disease for females, whereas males suffering traumatic injury—battle casualties, for instance—suffer as profound states of shock, as any pregnant female ever suffered, and yet a pituitary insufficiency rarely, if ever, develops. So far as the Falta syndrome is concerned, it assumes a simultaneous sclerosis of several endocrine glands. His cases were studied only clinically without confirmatory anatomic checks, and therefore his theory is only an unproved hypothesis.

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2. Falta, W. Die Erkrankungen der Blutdrusen. Berlin: Julius Springer, 1913. Pp. 363-373.

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AN URGENT REQUEST

The hands of your State Health Department are tied so far as effective control of communicable disease is concerned unless we have the whole-hearted cooperation of every physician in the State.

We recently sent out a letter emphasizing the importance of accurate reporting. For two or three weeks after this letter, reporting reached an all time high of 60% of the practicing physicians. This week, however, the figure has dropped back to 53%.

In a recent week our reports showed that 58% of the M.D.'s reported, while 69% of the Osteopaths reported during the same period.

This is a season of the year when most communicable diseases are at their height, so accurate reporting is all the more necessary in order that we may be ready to give whatever assistance is necessary.

Again we earnestly request your wholehearted cooperation in this important matter.

C. G. Salsbury, M.D.
Director of Public Health

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5th ANNUAL MID-WINTER RADIOLOGICAL CONFERENCE

The 5th annual mid-Winter Radiological Conference will be held at the Ambassador Hotel, Los Angeles, California, on Saturday and Sunday, February 21 and 22, 1953. A banquet preceded by cocktails will be held at the Ambassador Hotel, on Saturday evening, February 21. Hotel reservations should be made as soon as possible through the Convention Manager, Ambassador Hotel, Los Angeles. The out-of-state speakers will be Dr. Fred J. Hodges, Dr. H. Dabney Kerr and Dr. Ira H. Lockwood.

Conference reservations may be made through Dr. M. M. Haskell, 615 Times Building, Long Beach 2, California. The Conference fee is $20.00, and dinner will be $6.00 per plate.

Courtesy cards are available to radiological residents and radiologists in military service by pre-registration.

Editorial

ARIZONA MEDICINE
Journal of
ARIZONA MEDICAL ASSOCIATION, INC.

VOL. 9 DECEMBER, 1952 NO. 12

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The Editor sincerely solicits contributions of scientific articles for publication in ARIZONA MEDICINE. All such contributions are greatly appreciated. All will be given equal consideration.

Certain general rules must be followed, however, and the Editor therefore respectfully submits the following suggestions to authors and contributors:

1. Follow the general rules of good English, especially with regard to construction, diction, spelling, and punctuation.
2. Be guided by the general rules of medical writing as followed by the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION. (See MEDICAL WRITING by Morris Fishbein.)
3. Be brief, even while being thorough and complete. Avoid unnecessary words. Try to limit the article to 1500 words.
4. Read and re-read the manuscript several times to correct it, especially for spelling and punctuation.
5. Submit manuscript typewritten and double-spaced.
6. Articles for publication should have been read before a controversial body, e.g., a hospital staff meeting, or a county medical society meeting.

The Editor is always ready, willing, and happy to help in any way possible.

"A GOOD AND FAITHFUL STEWARD"

Just about this time of the year, ten years ago, the Council of the Arizona State Medical Association drafted Dr. Frank J. Milloy to serve as secretary of the Association. This was in the midst of the presidential term of Dr. E. Payne Palmer, Sr., when the secretaryship was vacated by the enforced resignation of the secretary elected at the 1942 meeting of the Association. Dr. Milloy, a very busy internist, accepted the urging of the Council to take over the heavy responsibilities of this important office and for the past ten years has rendered an outstanding service to the medical profession of the state. In spite of the employment of a full time executive secretary and other office help for the details of the ever enlarging affairs of the Association, the duties of the elected secretary have grown through the years and have been faithfully and efficiently carried on by Dr. Milloy.

FRANK J. MILLOY, M.D.

When Southwestern Medicine, the official organ of the Association, suspended publication with the December, 1943, issue, owing to war conditions, our Association was left without a medium of communication to its membership and for the publication of its scientific material. Little time was lost by the Council in launching ARIZONA MEDICINE, which began publication in January, 1944. Dr. Milloy accepted the added responsibility as Editor-in-Chief of this journal, organized an able editorial staff, secured efficient business management, and has made

our journal one of the outstanding state medical magazines of the country, in appearance, in editorial policies and in quality of material published.

It will be with deep regret that the medical profession of the state accepts the decision of Dr. Milloy to relinquish this dual responsibility. Ten years of voluntary service is quite a little to expect of one man, and it is with gratitude to him that we look back over those years of faithful administration during the trying period of war and the postwar years of readjustment of our affairs to a rapid growth of our state in population and just as marked and rapid increase in the numbers of medical men entering into practice in Arizona.

We thank you, Frank, for your efficient discharge of the duties entrusted to you, as a "good and faithful steward."

W. Warner Watkins, M.D.

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"BIG SHOES"

Dr. W. Warner Watkins who wrote the above tribute to Dr. Milloy knows whereof he speaks. He has formerly served both as Secretary of the Association and as editor of Southwestern Medicine and understands perhaps as no other man the problems faced by and the demands made on Dr. Milloy in his years of devoted service. I do not presume to add to what has been so well said but do reiterate our gratitude for a job so well done.

It is with many misgivings that I take up the task which Dr. Milloy has felt he must lay down. I'm fearful as I review the fine work he has done and also the excellent record of Dr. Watkins before him. Metaphorically these men wear big shoes. I cannot promise to carry on the work as well as they have done, but I can and do promise to try. To that end I covet your cooperation. I pray that you will be patient with me, forgiving my errors and helping me with your suggestions.

This journal is yours. Will you help me to make it speak for you? I'm rolling up my sleeves; and *you*–? Now,–let's "have at it"!

R. Lee Foster, M. D.

——o——

WARNING

YOUR CONTRACT OBLIGATION MALPRACTICE INSURANCE

The attention of all physicians is directed to the terms of your malpractice insurance coverage. Your policy is a binding contract between YOU and the INSURANCE CARRIER. It is incumbent upon YOU on the first pretext of a possible malpractice claim to immediately notify your insurance company, either direct or through your agent, informing him of the circumstances.

Recently, we came upon a case wherein the insurer, while determining to defend the suit for the insured, reserved full right to deny any liability for any judgment which might be rendered because of such breach of policy provision. It so happened that a patient was attended in December of 1947. In the fall of 1948 the husband of the patient saw the attending physician and made a specific demand for $5,000 in settlement of his grievance. The physician advised the complainant that, in his opinion, there was nothing to settle. At this point he should have promptly notified the insurance carrier of a possible claim. However, he took no further action until he was served in December, 1949, with notice of suit filed and not until January, 1950, did he notify his insurer. The reason for this requirement is obvious–to allow the insurer to make an immediate investigation, contact any and all witnesses then living for the purpose of obtaining testimony and thereby possibly avoid what might otherwise develop into a case of more serious proportions with the passing of time. Fortunately, in this instance, the delay in reporting the potential claim did not result in any prejudice to the insurer as the attorney succeeded in securing a verdict for the defendant.

It would be well for each physician to thoroughly acquaint himself or herself with the provisions of his or her malpractice insurance contract and thus avoid possible misunderstanding and additional expense.

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MOTION PICTURES

The Committee on Medical Motion Pictures of the A.M.A. has asked me to transmit the following notice for release in your journal:

The Committee on Medical Motion Pictures has announced the publication of a new revised film list which includes 78 medical films not readily available from other sources.

This list will be available for distribution after December 1, 1952. A copy may be obtained by writing the Committee on Medical Motion Pictures, American Medical Association, 535 N. Dearborn Street, Chicago 10, Illinois.

TOPICS OF *Current Medical* INTEREST

RX, DX, AND DRS.

By GUILLERMO OSLER, M. D.

An odd experiment with unexplained results was performed on a group of 'fortunate' U. of Cincinnati medical students by Dr. R. C. Muehrcke of the General Hospital. . . . Each student ate 1½ pounds of RAW CALVES' LIVER daily for 4 weeks. An EOSINOPHILIA occurred which lasted from 2½ to 3 years, and which was accompanied by a notable good health and freedom from disease. . . . Cooked liver, raw beef liver, and 35 different liver extracts were not similarly effective. . . . The relationship to diseases and glands is still speculative, tho interesting.

How many readers know the LEGAL LIMITS OF A DEBT? How long can you let a bill go without collection? . . . Back in Indiana it was 6 years (Too late in Arizona, Doctor!) Well, in Illinois it was five. (Still too late here.) . . . In Arizona the LIMIT IS 3 YEARS, and any debt is outlawed thereafter. Repeat, 3 years. . . . The limit varies from 2 years in Texas to 8 years in Wyoming.

INTESTINAL SYMPTOMS which follow the ingestion of certain foods may not be the result of an allergy, tho the possibility has been rightly emphasized in the October ARIZONA MEDICINE. . . . Dr. Lowell Goin has reported (in RADIOLOGY) that the guilt which follows the intake of a forbidden food (such as pork by a Jewish woman) may result in psychosomatic intestinal symptoms and x-ray signs. Ground pork, given without knowledge, produced no emotional or physical reaction at all.

Charles Cowan lives in Anaheim, California. This is the same town which has been made somewhat well-known by Jack Benny, whose railroad trains always go thru "Anaheim, Azusa, and Cucamonga!" . . . Mr. Cowan has his own claim to fame. He was the first person in the United States to receive INSULIN, and the first to change to a special CH diet. Furthermore, he is 84 YEARS OF AGE.

The newest trade-preparation ANTIBIOTIC is 'Erythrocin', of the Abbott Laboratories, It will more than likely come into some use. . . . Investigation has shown it to have a low toxicity; rare G.-I. disturbances from oral administration; and a specially good effect against gram positive organisms. . . . The last mentioned is of value in a world which seems populated with penicillin-resistant strains. . . . Its origin is Streptomyces erythreus, and Erythrocin is the Abbott name for erythromycin. A special coating protects the tablets from gastric digestion. . . . The research groups contain the names 'Finland' and 'Herrell', which are good signs.

The American Ass'n. for Thoracic Surgery (San Francisco, March 27-30, 1953) always has a large number of non-member auditors. This spreads the information around, but the members often find no place to sit. . . . It is too late to suggest a remedy for 1953, but here is a possibility for later, — schedule all papers for 8 A.M., and title all topics on esophageal surgery. They could then hold the sessions in a coffee-shop.

If the name Samson (Sec'y. of AATS) is familiar to constant readers of this journal, then Dr. H. Brodie Stephens (Chairman of reservations) should also be well known — especially if you follow football. Brodie caught the famous 'long pass' from Dr. Brick Muller in a Rose Bowl game against Ohio State some twenty years agone. . . . Dr. Delbert Secrist of Tucson could give details on the game, since he played in the Bowl a year from that time on a W. and J. team.

The public prints tell of two Boston doctors (one probably named White) who have followed 100 patients with chronic HIGH BLOOD PRESSURE for as long as 34 years. Seventy one patients are still living and only 5 are seriously handicapped. . . . The same magazine summarizes the statistics on CHLOROMYCETIN. Over 8,000,000 patients have received the drug. At least 72 deaths from aplastic anemia are known. The F. & D. A. says the drug may still be used; a warning leaflet is to be sent with every package; and it is to be used only when its risk must be taken (typhoid). Brucellosis, spotted fever, and typhus have other, safer therapeutics.

About four years ago this journal contained an editorial on 'ARIZONA AND THE WEATHER'. The engineering and commercial consultants who supplied the technical information on AIR-CONDITIONING agreed that refrigeration cooling was the ideal future method. Ideal but expensive, and definitely of the future. . . . A room-conditioner then cost about $350 to $450, and it was said that the cost would not decrease more than 10% or so. We believed that the cost would come down more than that, what with mass production, a probable demand, etc. . . . Now we find air-conditioning is to be the imminent big business. And an announcement has just arrived of a new conditioner which cools, dehumidifies, and circulates at a cost of $229. . . . We should have made a bet with that engineer.

Bauer and Black are pleased with the results obtained from the routine use of ELASTIC STOCKINGS in the Mass. Mem. Hospital. . . . They apparently prevent pulmonary embolism from the legs, a cause of death in 34,000 patients per year in the U. S. . . . Litter and Wood report the progress of 2,500 patients who wore elastic stockings and an equal number who wore stockinette. There were 4 fatal cases among the controls, none in the treated group; there were 12 non-fatal cases among the controls, 2 in the treated group. . . . P.S., Bauer and Black sells the stockings.

Dr. Walter Alvarez gently sprinkles cold water on the B. F. Sieve report of a method of FERTILITY CONTROL. . . . A series of 298 women were supposed to be prevented from conception by regular oral doses of phosphorylated hesperidin. Dr. Alvarez cautions against too early acceptance on the following points,—it was only one fast, brief series; previous usage in mice was not a success; other species were not used; the theory is not an accepted one; the auspices or connections were not well known; one man can become enthusiastic; the work has not been repeated; the results are too nearly 100%; and 600 people could hardly be found who would take their pills without fail!

The prize article on FEE-SPLITTING is a humorous one from 'Medical Economics' by Dr. Theodore Kamholtz. In the manner of Spooner, he splits words, until it is almost impossible to intentionally say them right. . . . He says that when tension and tempers are not high, one talks of FLEE-SPITTING. If the argument becomes warmer, it can be called SPLEE FITTING, or even FIT SPLEEING. If discussors get to the shouting stage, they may arrive at SPIT FLEEING. . . . The humorist then tinctures his good idea with a few barbed shafts at the medical people who do or do not spit flees—flit splees—.

Like old soldiers (who simply fade away), a contemporary of ARIZONA MEDICINE in California is quietly folding in October. . . . The 'Annals of Western Medicine and Surgery' has been quoted in this column at intervals, and has done a good job in presenting research reports from the Los Angeles area. It was published by the County Medical Ass'n. . . . The only distress rocket was sent up by the editor, who claims that the junking was not necessary.

Here is a brief story, not uncommon, which shows the gap between a LAYMAN'S CONCEPT and a PHYSICIAN'S INTERPRETATION. . . . "Yes, poor Gloria is dead. She had a tooth pulled, and then had trouble with her jaw. After that she got an infection of her nervous system and was in the hospital for $3,000. They tried all sorts of drugs, and I think only 'chloromycin' worked. Her bone marrow softened. She went to her home town and they said she had leukemia and she died in two weeks". . . . Intriguing to speculate on the exact drug and diagnosis.

PULMONARY CONCENTRATION OF PENICILLIN has become important with the finding that one form of the drug loves the lung. . . . 'Neo-Penil' of Smith, Kline, and French is penethamate hydriodide (penicillin G diethylaminoethyl ester hydriodide). It concentrates in certain body tissues and fluids, especially in the lungs and bronchial secretion where it may be 5 to 10 times as concentrated as in the blood, and as much higher than benzylpenicillin (G). . . . Very little work has been published on the effects, but the therapeutic and prophylactic value is obvious and probable. . . . The ill, the aged, and the post-operative should especially profit.

Sir William Osler, a strictly literary relation of Guillermo, once urged the use of 'DAYTIGHT COMPARTMENTS' as a way of living. . . . The idea is intriguing,—live from day to day; do not worry about what is ahead; stop looking back over the shoulder. . . . Probably even Sir William would not restrict the 'cells' too rigidly, since what would happen to hospital insurance, and to pathologists!

The Clay-Adams company has a wonderful ADVERTISEMENT FOR AN 'AUTOCLIP APPLIER' which closes operative incisions by the use of metal clips. . . . The description has all of the mystery and suspense of a 'Whodunit' short story. The unanswered question, which leaps to the eye of the non-surgeon, is "How are the clips removed?". . . . Maybe it's a serial advertisement, and next month's issue will give the answer.

Speaking of MEDICAL ADVERTISEMENTS, The Birtcher Corporation, maker of electrical high frequency instruments, has a peculiar and reminiscent one in current journals. . . . (It reminds one of the Florida politician who told the natives that his opponent was an extrovert, was secretly a student of semantics, and several other words open to being misconstrued). . . . The Birtcher adv't. shows an attractive, bare-shouldered woman, and the subtitle reads, "She's Been Hyfrecated".

New aureomycin minimal dosage for adults —four 250 mg. capsules daily, with milk.

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The successful use of aureomycin, as described in publications by physicians throughout the world, has increasingly encouraged others to use this antibiotic and publish reports thereon. To date, more than 7,000 original reports, editorials, brief comments, and similar notations have appeared in the published literature.

The trend of the literature clearly indicates that in desperate situations caused by infection, where previously cure would have proved difficult or impossible, aureomycin has saved the day.

Capsules: 50 mg.—Vials of 25 and 100. 100 mg.—Vials of 25 and bottles of 100. 250 mg.—Vials of 16 and bottles of 100.
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REPORT OF THE EXECUTIVE SECRETARY

CLINICAL SESSION—AMERICAN MEDICAL ASSOCIATION DENVER, COLORADO

Your Executive Secretary in company with Jesse D. Hamer, M.D., Association Delegate to the AMA, attended the Sixth Annual Clinical Session of the American Medical Association held in Denver, Colorado, December 2-5, 1952, with headquarters at Hotel Shirley-Savoy.

Monday, December 1, 1952, in advance of the Clinical Session, the Fifth Annual Medical Public Relations Conference was held. The theme: "Mutual Understanding—The Key to Better Public Relations." Chairman of the General Session was W. A. Liggett, M.D., President of the Colorado State Medical Society. The address of welcome was delivered by George F. Lull, M.D., Secretary and General Manager of AMA. Edward J. McCormick, M.D., President-Elect of AMA delivered the keynote address: "Medical Public Relations Today." He emphasized: "Mutual understanding can only be based on mutual knowledge and trust. To build such understanding we must tell the positive story of American medicine again and again. We must describe the many projects which we are undertaking to benefit the health of the people. We must ask the help of others in our programs, so that the workers for the cause of better health will be multiplied. We must share our ideas, our hopes and our dreams with the rest of America. Mutual understanding is a two-way street. Mutual understanding is built upon mutual respect."

There must be no let up now that we have a new Administration. Every physician should be brought the message how he can improve his public relations. A two-act play: "Practice-ly Yours" was a presentation in point, staged by the Denver University School of Theater, action taken depicting a typical scene in the doctors' offices and waiting rooms of today, and showed how the receptionist and physician should and should not attend the patient PR-wise. Continuing society discipline of its members where necessary is urged. The fee structure, itemizing bills and proper indoctrination of medical assistants were discussions pointing up the need and suggesting a course to further improve the physician-patient relationship. Keeping up-to-date on and participating in medicine's activities, encouragement and support of hospital and medical prepayment plans, financial assistance to medical schools and support of community projects have contributed much in the past to improve the physicians' public relations and there should be no letup to this end lest the gains of yesterday be lost tomorrow. While in this country today, there are more practicing doctors than elsewhere, physicians to population ratio, many of our societies, it is reported, are providing scholarships to prospective, qualified medical students in an effort to maintain this favorable record. Progress is our achievement to date.

Albert Williams, Sr., of Denver, president of the United States National Bank, addressing the luncheon meeting said: "Fear is at the bottom of all human problems. The greatest thing a doctor can do is to quiet the fears of the people. Health is a national asset, a national security. Doctors have the confidence of both the sick and the well. The community thinks highly of the doctor and expects much from him. We must work together as Americans to protect America. The future of our country is in his hands. With the future of the United States in the hands of such intelligent, God-fearing and hard working people, I'm not afraid."

As member of the Executive Committee of the Medical Society Executives' Conference, I attended a half-day session devoted to the business affairs of the Conference, revision of By-Laws and plans for the annual meeting in New York; likewise, I attended all sessions of the AMA House of Delegates and several of the Reference Committee meetings. Possibly the most controversial subjects presented for discussion were those dealing with the "doctor-draft act extension" and "costly veterans' hospital care, service-connected and non-service connected, including care of dependents". Dr. Hamer will report on the proceedings.

Dr. John Matson Travis of Jacksonville, Texas, received the gold medal and citation symbolic of the honor, having been named GP of the year at the opening session of the House.

A third contribution of $500,000 by the AMA to the American Medical Education Foundation was announced.

Member physicians registered included Jesse D. Hamer, Phoenix; Harry A. Barnes, Flagstaff;

NOT FOR PROFIT

THE HOSPITAL BENEFIT *Bulletin*

Special Published Bi-Monthly by the Hospital Benefit Association, First Street at Willetta, Phoenix December, 1952

Question QUIZ
Do you know the answers?

Q. Does the Hospital Benefit Association cooperate with doctors and hospitals?

A. Yes. The Association cooperates in every possible way. It actively supports the standards of the medical profession. And payments are made as quickly as possible with a minimum of "paper work" for doctors and hospitals.

Q. How do hospitals and doctors benefit from the Association?

A. Both benefit from HBA, because member-patients are financially able to pay hospital and surgical bills when needed—thus enabling hospitals and doctors to provide more effective treatment.

Q. How many Association members are there today?

A. More than 35,000.

Q. May HBA members choose their own hospitals and doctors?

A. Yes. Member benefits are paid to any licensed hospital or physician (M.D.) anywhere in the world.

"I'm warning you, Henry, one smart crack like 'What's Cooking?' and you've had it!"

Hospital Benefit Association To Honor Arizona Hospitals In Christmas Day Broadcasts

Program of Christmas Carols Will Be Broadcast On Nine-Station Radio Network, 4:00-4:30 P.M.

As a tribute to the fine work being done by the medical profession in Arizona, the Hospital Benefit Association will sponsor a half-hour broadcast on Christmas Day to call the public's attention to the important services being rendered by the state's hospitals and doctors.

The program will be broadcast over a nine-station network from 4 to 4:30 p.m. It will feature a well-known choral group singing favorite Christmas carols. And it will vividly tell about the work being done by doctors, nurses and hospitals who are true "Angels of Mercy"—not only at Christmas-time but throughout the year.

The directors, officers and staff of the Hospital Benefit Association want to thank all doctors, nurses and every staff member of every Arizona hospital for their splendid cooperation during the past year, and to wish all of you and your families a Merry Christmas and a Happy New Year.

Public Relations Program

This is part of the Association's continuing public relations program which has, on every occasion, wholeheartedly supported the standards of the medical profession. The Association has devoted considerable radio and newspaper advertising to combat any form of socialized medicine or compulsory health insurance. It has always supported the recruiting of nurse trainees. And it publishes a bimonthly bulletin for its members featuring health articles by outstanding doctors.

New A. M. A. Booklet Makes Good Reading

The Hospital Benefit Association would like to compliment the American Medical Association on the splendid booklet, "Winning Ways With Patients", which was published recently and sent to all A.M.A. members.

This booklet contains many important hints which can be of benefit in doctor-patient relationships. If you have not already received your copy, or would like extra copies, write to Lea Brown, Director of Publications, American Medical Association.

TUNE IN ON ONE OF THESE ARIZONA STATIONS

Phoenix	**KTAR**
Tucson	**KVOA**
Yuma	**KYUM**
Prescott	**KYCA**
Globe-Miami	**KWJB**
Safford	**KGLU**
Douglas-Bisbee	**KAWT**
Winslow	**KVNC**
Flagstaff	**KCLS**

George D. Boone, Tucson; Ian M. Chesser, Tucson; Roscoe A. Gutekunst, Phoenix; Dale C. Hathaway, Ray; Elvie B. Jolley, Bisbee; Samuel R. Joseph, Phoenix; Harry S. Beckwith, Winslow; and Juan E. Fonseca, Tucson. Others who may have been in attendance were not yet listed as of the latest release available.

Respectfully submitted,
Robert Carpenter
Executive Secretary

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ARIZONA PHARMACEUTICAL ASSOCIATION, INC.

The officers and members of the Arizona Pharmaceutical Association want to thank you for the opportunity of having this little chat with you every month. There are many problems, in this day of multitudinous laws and regulations, of mutual interest to all who are engaged, in any manner, in the health and welfare of the public. Every year we are faced with new interpretations of present laws and with new legislation and court decisions.

One of our most stringent regulatory measures is the Harrison Narcotic Law, as amended. This law, together with the addition of the new amendments to the Arizona Narcotic Act, passed by the legislature this past year, provides more teeth for enforcement of their respective provisions.

I am particularly anxious to bring you some information relative to the enforcement of these laws. As you may now, the enforcement of the Arizona law relating to the sale of narcotic drugs has been invested in the Arizona State Board of Health, together with all other peace officers and all county attorneys.

At the 1952 session of our legislature, a new liquor control act was passed. Section 72-103b, subsection 9 of this act reads, in part, as follows:

> "it shall be the duty of the Superintendant of Liquor Licenses and Control to assist in the enforcement of the provisions of law relating to the possession and sale of narcotic drugs".

In conformity with this new provision, the Superintendant setup a narcotic squad within the department of Liquor Licenses and Control. These men have been working closely with the federal narcotic agents and, the latter part of November, began working with the pharmacies of our state. They are especially interested in the acceptance of prescriptions for narcotics over the telephone. Article 172 of the Federal Act states:

> "the furnishing of narcotics pursuant to telephone advice of practitioners is prohibited, whether prescriptions covering such orders are subsequently received or not".

Under this article the prescription must be in the hands of the pharmacist prior to the delivery of the medicine. Mailing narcotic prescriptions by a physician, after delivery is made by the druggist, is not allowed. You, doctor, may have been inconvenienced by a request from your pharmacist for the prescription before he can deliver the medicine. It is our hope that you will bear with us, in this particular. Every pharmacist is being warned, by the officials, not to fill prescriptions pursuant to telephoned orders. Failure to comply will make them subject to prosecution and, if convicted, will cause them to lose their license to practice their profession.

In order to facilitate this program, if you do phone a prescription to your pharmacist, will you leave the original with your office nurse, or if you are on a house call, with the patient, so the pharmacist's delivery boy may pick it up without undue delay?

We shall do everything within our power to expedite your prescriptions and shall endeavor to prevent any uncalled for delay. The practice of our profession is of paramount interest to all of us but this is one time when we are faced with a somewhat untenable situation. We shall need your cooperation. Thanks loads.

——o——

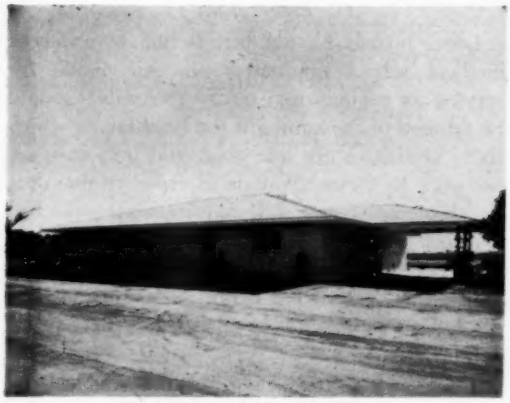
PAN-PACIFIC SURGICAL ASSOCIATION

The executive office of the Pan-Pacific Surgical Association announces that the Sixth Pan-Pacific Surgical Congress will be held in Honolulu in November 1954.

Included in the scientific program will be sessions in all divisions of surgery and related fields, with papers presented by topflight surgeons from the Pacific Area countries.

For further information concerning the Sixth Congress or membership in the Association, doctors may write to the Pan-Pacific Surgical Association, Suite 7, Young Building, Honolulu, Hawaii.

GLENDALE CLINIC



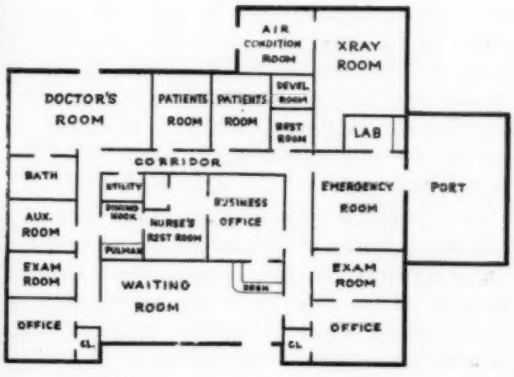
Front View of Glendale Clinic

Emergency Room

X-Ray Room

Dr. Fulk and two of his assistants

Reception Room



Floor Plans

MURL E. FULK, M.D.
PHYSICIAN and SURGEON
Telephone YEllowstone 7-7240 (Phoenix) Lateral 16 and Glendale Ave. Glendale, Arizona

PHYSICIANS AND SELECTIVE SERVICE

This brief article has been compiled to convey as much information as is presently available on the relationship of physicians, dentists, and veterinarians to the Selective Service system. On points not made entirely clear it is suggested that inquiry be made at the Arizona State Headquarters of Selective Service, Phoenix, which is headed by Gen. A. M. Tuthill, or consult his local board or his state advisory committee.

Subject to Call

All physicians up to and including the age of fifty are eligible for service under Special Registration, but the younger doctors are generally inducted first.

Double Liability

A registrant is said to be "doubly liable" for service when he (1) was born after August 30, 1922, and under the Universal Military Training and Service Act of 1951 as amended, is eligible for service like any other male born after that date, and (2) is eligible for service because he is a physician, dentist or veterinarian and registered as a Special Registrant under Public Law 779.

Most of the younger professional men fall into the double liability group and have received temporary deferments as regular registrants to complete their schooling and one year internship. Upon completion of the one year internship, a local board, in most cases, automatically reclassifies a registrant into the classification for which he qualifies. If he has received a deferment as a student or intern, his liability as a regular registrant is extended to age 35. If he qualifies for and receives a 1-A classification he can be ordered for induction as a private by his local board.

By a thorough understanding of the laws and regulations in these matters the young professional man may be able to make plans well in advance of the time they may be required to enter military service, and have sufficient time to accept commissions in the branch of service they prefer, thus eliminating the possibility of their being inducted as enlisted men.

Any physician classified 1-A by a local board may appeal his classification within ten days after receipt of the 1-A, by sending a letter direct to his local board. In the letter of appeal it must state "I hereby appeal my classification", with reasons set forth for the appeal.

Essentiality

Local boards having jurisdiction over recent medical school graduates who are liable for service as regular registrants (recruits) should be advised of the names of the hospitals in which these graduates are interning, and that they are essential to these hospitals in order to maintain the minimum house staff requirements—which is a direct contribution to the maintenance of the National health, safety, or interest. This is to insure these men from being inducted into service before completion of their one year internship.

In declaring anyone not available for military service because of teaching or research work it is necessary that they have been engaged in this work for from four to five years on a full-time basis. This does not include the training necessary to enter this work. When a man is declared essential to a medical school or hospital for research or teaching it is necessary that the university or hospital try to seek a replacement.

The criterion for essentiality rating—the physician must have been in the community four years in full time practice, in a community with limited medical facilities, and his entry into active military duty with the Armed Forces would make the health standards of the community fall below minimum requirements. The total population of the community concerned, and the surrounding community in which the physician practices, should be considered, along with hospital facilities available. Consideration must also be given as to how many other physicians are within a reasonable travel distance, and how far it is to another town with adequate medical facilities, taking into consideration the number of physicians available to any particular group.

A physician declared not available for service because of reasons of essentiality to a community, must try to seek a replacement for himself in that community.

Induction

A man ordered for induction as a Special Registrant may apply for and accept a commission, so he will not be inducted as a private. It takes a minimum of ninety days for Navy and Air Force commissions to be processed and for the men to be appointed. The Army can, in

extreme cases, process a case within three weeks.

When a registrant who is also a Special Registrant is being inducted as a regular registrant, he will have the same opportunity to secure a commission as a Special Registrant, and the local board should so advise him.

A special Registrant who is ordered for induction as a Special Registrant, and who accepts a commission, will not report for induction. When ordered to report for induction as a regular registrant he will be inducted unless he accepts a commission and actually enters on active duty by the date set for the induction.

——O——

U. S. HOUSE OF RPRESENTATIVES

At least 5 M.D.'s in the House of Representatives are assured at this writing. Re-elected were: Minnesota—Dr. Walter H. Judd (R); Nebraska—Dr. A. L. Miller (R); Pennsylvania—Drs. I. D. Fenton (R) and T. E. Morgan (D). For a first term is Dr. Will W. Neal (R) of West Virginia. In Idaho a very close contest which may result in a recount discloses Dr. John T. Wood (R) seeking re-election trailing his Democratic opponent.

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MAN BEHIND THE TEST

The ancient Hebrews decreed that a warning blast should be sounded on the *shofar* to mark the third case of an infectious disease in a community, but diphtheria rated a *shofar* warning for the very first case. Few diseases have been so dreaded as diphtheria, partly because it is especially deadly for children in the tender two-to-five age bracket. Last week Yeshiva University in New York City held a special convocation to give an honorary degree to a physician who had done much to take the dread out of diphtheria: Bela Schick, the little-known man behind the famous Schick test.

When Bela Schick was still a boy in Hungary, German researchers tracked down the microbe which causes diphtheria, and isolated the poisonous secretion which makes a strange, strangling membrane grow across many a victim's throat. They got as far as developing a horse serum which could be used either as a preventive against the disease or as a remedy after it had struck. But so many people got sick from the serum itself that doctors hated to give it as a preventive unless they could be sure that it was really necessary. They needed a test to show whether a patient had acquired immunity to diphtheria.

As a young doctor in Vienna, Schick worked with Clemens von Pirquet on serum sickness and similar sensitivities. The two coined the word "allergy." Von Pirquet hit upon the tuberculin test, which shows whether the subject has (or has ever had) tuberculosis, and Schick thought the same idea might be applied to other diseases. What he got was slightly different but more valuable: a remarkably accurate and fairly simple test which shows whether a subject is vulnerable to diphtheria.

Schick announced the test in 1913. Within ten years, a new and far safer immunizing substance (toxoid) took most of the risk out of preventive measures. Nowadays, throughout most of the U.S. and in many another country, babies get their first protective shot by the time they are a year old. Years after the first shot, the Schick test (two injections, one in each arm) shows whether the immunity has lasted or needs renewing. And it will show at any time whether a preventive shot has "taken."

Although the Schick test was intended mainly for children, its usefulness extends to their elders. For adults are more likely than youngsters to have allergic reactions to immunization shots, so it is especially important in their case to give no unnecessary innoculations. Sensitive grown-ups often can be immunized by tiny, repeated doses of toxoid.

Slight, gentle Pediatrician Schick, 75, childless himself, has treated tens of thousands of children in Vienna and (since 1923) in New York City, stil commutes by subway from his Manhattan home for office hours in Brooklyn. More than the medals he has received he treasures a thank-you book signed in 1933 by a million New York City school children. Yeshiva's new million-dollar department of pediatrics is to be named for Dr. Schick. His most enduring monument: the test which helps to save lives.

*Reprinted from TIME, December 8, 1952.

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LEST WE FORGET!!

About to go into the RED despite a continuing post-war boom is Britain's cradle-to-grave social security program.

Collections from 23 million adult Britons plus planned government contributions from tax funds have exceeded benefit payments thus far. A reserve of about 3 billion dollars has accumulated. However, hundreds of thousands of men and women are becoming eligible for retirement pensions and the payments are about to multiply rapidly. For a weekly payment of 70 cents, plus another 60 cents collected from his employer, the Briton has been promised complete protection against poverty from before birth until after he is laid in his grave. He *and* his employer are now asked to chip in another 10 cents a piece.

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FIRST ANNUAL MEETING
ARIZONA ACADEMY
— of —
GENERAL PRACTICE
SAFFORD, ARIZONA
JANUARY 24 and 25, 1953

Program

SATURDAY, JANUARY 24, 1953

8:00 A.M.....Breakfast - Safford Inn
State Officers and Directors 1952-53
Morning Moderator.....F. W. Knight
Safford, Arizona

9:00 A.M.....William Moretz
Professor of Surgery,
University of Utah College of Medicine
"The Management of Injuries of the Hand"

10:00 A.M.....John F. Waldo
Professor of Medicine
University of Utah College of Medicine
"The Differential Diagnosis and Management of Respiratory Infections."

11:00 A.M.....Emil Holmstrom
Professor of Obstetrics
University of Utah College of Medicine
"The Management of Functional Bleeding"

NOON-2:00 P.M...Luncheon-Business Meeting
Election of Officers, Etc.
Safford Inn

Afternoon Moderator..Calvin Williamson—Yuma

2:00 P.M.....Morton H. Leonard, A. B. O. S.
El Paso, Texas
"Treatment of Severe Sprains of the Ankle"

3:00 P.M.....William Moretz
"Recent Advances In Abdominal Surgery"

4:00 P.M.....John F. Waldo
"The Diagnosis and Management of the Acute Phase of Poliomyelitis"

7:00 P.M.....Cocktail - Dinner - Party
Safford Inn

SUNDAY, JANUARY 25, 1953

Morning Moderator.....Lucille M. Dagres
Phoenix

9:00 A.M.....Emil Holmstrom
"The Management of R H Problems"

11:00 A.M.....John F. Waldo
"The Modern Uses of the Anti-Biotics"

11:00 A.M.....William Moretz
"Recent Advances in Vascular Surgery"

Noon
to
2:00 P.M.....Luncheon - Safford Inn
Question and Answer Type

ADJOURNMENT

Saturday Luncheon for Wives: Arranged

That while the meeting is fundamentally for members of the Arizona Academy of General Practice all general practitioners in the State are cordially invited to attend and if they do so, will they please contact: Donald E. Nelson, M. D., Safford, Arizona, stating their intentions.

SEMINAR OF THE AMERICAN CANCER SOCIETY IN ARIZONA

The American Cancer Society-Arizona Division, in collaboration with the Arizona Medical Association, will hold the first Cancer Seminar of its kind in the Southwest, in Phoenix on January 15, 16 and 17, 1953. It is hoped that this type of seminar will become an annual affair. Dr. Edward Bregman, Chairman of the Arizona Division of the American Cancer Society, recently attended the National Convention and brought back the plans for this regional seminar. This coming meeting is the fruition of these plans.

The three day meeting will include lectures by eminent men in the field of cancer from all parts of the country. These specialists are Drs. Dudley Jackson, D. A. Todd, Lewis W. Guiss, L. H. Garland, Wm. S. McComb, David A. Wood, Edward Banner, U. V. Portmann, and John C. Jones. The subjects covered will include among others cancer of the skin, generative organs, stomach, lung and oral cavities.

Dr. Thomas Bate, President of the Arizona Medical Association, will open the convention at noon, Thursday, January 15, 1953, at the Paradise Inn Resort near Phoenix. Each meeting will have as a moderator eminent medical men of Phoenix and Tucson with discussion from the floor and a question period after each subject. Round table lunches will help generate a closer group discussion each day. There will be a banquet on Friday Night, January 16, 1953.

The detailed program with the names of the speakers, their subjects, the names of the moderators and other pertinent data will be mailed to every member of the Arizona State Medical Society as well as to members of the State Societies of the Rocky Mountain area, a total of 4500-5000 invitations being extended. Arrangements are being made to find accommodations for all visiting medical men and their wives either at the Paradise Inn or other closeby resorts, to provide transportation to the meetings, if necessary, etc.

It is hoped that there will be an excellent turnout of local doctors, thus assuring a continuation of these seminars on an annual basis.

CANCER SEMINAR
AMERICAN CANCER SOCIETY
Arizona Division
In Association
With
ARIZONA MEDICAL ASSOCIATION

PROGRAM

JANUARY 15 - 16 - 17, 1953
Phoenix, Arizona
All sessions of the Seminar will be held in the Convention Hall of Paradise Inn

THURSDAY, JANUARY 15, 1953

9:00-12:00 A.M. Registration

1:30 P.M. Opening of Seminar
Edward H. Bregman, M.D.,
Chairman, Board of Trustees,
Arizona Division, A.C.S.
Thomas H. Bate, M.D.,
President,
Arizona Medical Association
Introduction to the Seminar
Charles S. Cameron, M. D.
Medical and Scientific Director, American Cancer Society,
New York

2:00 P.M. Cancer of the Breast
Moderator:
Arthur J. Present, M.D.
Radiologist, Tucson
Speakers:
Dudley Jackson, M.D.
Director of Nix Tumor Clinic
Assoc. Professor of Surgery
Baylor University,
San Antonio, Texas
D. A. Todd, M.D.
Pathologist, Nix Tumor Clinic
San Antonio, Texas

3:30 P.M. Cancer of the Colon
Moderator:
Royal W. Rudolph, M.D.
Surgeon, Tucson
Speakers:
Lewis W. Guiss, M.D.
Asst. Professor of Surgery,
School of Medicine, U.S.C.
Los Angeles, California
L. H. Garland, M.D.
Professor of Radiology,
Standard Univ. Medical School
San Francisco, California

FRIDAY, JANUARY 16, 1953

10:00 A.M. Cancer of the Skin

Moderator:
J. Madison Greer, M.D.
Surgeon, Phoenix

Speakers:
William S. McComb, M.D.
Assoc. Surgeon, Chief,
Head and Neck Service
M.D. Anderson Hospital,
Houston, Texas
David A. Wood, M.D.
Professor of Oncology,
University of California
School of Medicine,
San Francisco, Calif.

11:30 A.M. Cancer of the Stomach

Moderator:
Henry G. Williams, M.D.
Surgeon,
Grunow Clinic, Phoenix

Speakers:
Lewis W. Guiss, M.D.
L. H. Garland, M.D.

12:30 P.M. Round Table Discussion—Luncheon

2:00 P.M. Cancer of the Ovary

Moderator:
Karl S. Harris, M.D.
Surgeon, Phoenix

Speakers:
Edward A. Banner, M.D.
Mayo Clinic,
Rochester, Minn.
U. V. Portmann, M.D.
Director of Radiation Therapy
Cleveland Clinics,
Cleveland, Ohio

3:30 P.M. Hospital Pathologist & Radiologist In Cancer Problems

Moderator:
Norman A. Ross, M.D.
Surgeon, Phoenix

Speakers:
L. H. Garland, M.D.
David A. Wood, M.D.

SATURDAY, JANUARY 17, 1953

10:00 A.M. Cancer of the Oral Cavity and Pharynx

Moderator:
Thomas A. Hartgraves, M.D.
Director of Laboratories
Grunow Clinic, Phoenix

Speaker:
William S. McComb, M.D.

11:00 A.M. Cancer of the Lung

Moderator:
D. W. Melick, M.D.
Surgeon, Phoenix

Speakers:
John C. Jones, M.D.
Thoracic Surgeon
Los Angeles, California
David A. Wood, M.D.

12:30 P.M. Round Table Discussion—Luncheon

2:00 P.M. Cancer of the Uterine Cervix

Moderator:
Preston T. Brown, M.D.
Gynecologist, Phoenix

Speakers:
Edward A. Banner, M.D.
U. V. Portmann, M.D.

3:30 P.M. A Research Project for Arizona

Speaker:
Charles S. Cameron, M.D.

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Woman's AUXILIARY

OUTLINE OF THE NURSES' LOAN PROJECT

I. The Nurses' Loan Fund was established in 1950.

II. The fund was about $600.00.
   a. The money was derived from:
      Contributions from members at large.
      One dollar per member from four county auxiliaries.
      Sixty dollars from interested members in Phoenix and other board members.
   b. In 1951 Maricopa County Auxiliary gave $300.00 to the fund because of its keen interest in the project.
   c. The Woman's Auxiliary to the Arizona Medical Association has most generously augmented the fund each year in order to help insure the success of the project and to help more applicants. Each member of the State and County Auxiliaries will have paid $5.00 toward the fund over a five year period. All members at large who have not contributed are urged to do so. Send your checks to the State Treasurer, Mrs. R. Lee Foster, 2215 North 11th Avenue, Phoenix, Arizona.
   d. In the three years since its appointment, the Committee has loaned $2450.00 to eleven young women to go through nurses training.

III. Requirements:
   a. B average in high school.
   b. Good moral character.
      Three references are required.
   c. Must show proof of needing financial assistance.
   d. Must pass a strict physical examination.
   e. Must be accepted by one of the four accredited schools of nursing in Arizona. These hospitals are:
      Good Samaritan, Phoenix, Arizona
      St. Joseph's Hospital, Phoenix, Arizona
      Memorial Hospital, Phoenix, Arizona
      St. Mary's Hospital, Tucson, Arizona
   f. Must have a personal interview with a member of the committee.

IV. Repayment of the Loan.
   a. The Loan requested must not exceed $300.00, is interest free. Repayment of the loan must start six months after the girl receives her state license to work at the rate of not less than $12.50 a month.
   b. If the girl does not finish her training she must start repayment within 30 days after leaving school. She must repay the loan at not less than $12.50 a month.
   c. Applications who receive the loans are required to sign contracts with the Auxiliary. A parent, or guardian, is also required to co-sign with the girl to repay the loan.

V. Where the girls who have received loans are now.
   a. Only one girl has graduated since the fund was established. She is living in Pennsylvania and has repaid $60.00 of the $100.00 loan.
   b. St. Mary's Hospital in Tucson
      One senior.
      One freshman in the September Class of 1952.
   c. Good Samaritan Hospital, Phoenix.
      One girl who is a senior and who has a brilliant record.
      Two freshmen students, September class of 1952.
   d. St. Joseph's Hospital, Phoenix.
      One senior girl.
      Three young women in their second year.
      One freshman girl who entered in September class of 1952.
   e. Families of the girls who have received loans live in Kingman, Morenci, Clifton, Globe, Tucson, Prescott, and Phoenix.

VI. How Committee gets applicants.
   a. Each January a letter is sent to all high school principals in Arizona telling of the availability of the loan and listing the qualifications. Two duplicate letters are enclosed, one for the school

nurse or vocational director and one for the bulletin board.

b. Last year an appeal was made through Arizona Medicine to all doctor's wives to help inform their communities of the project.

c. Last year most county auxiliaries had a Nurse Recruitment Week to inform the public of the great need for more trained nurses, and to interest high school girls in going through nurses' training. With the cooperation of the hospitals who arranged lectures, tours, and even luncheons for these girls the project was most successful. Tucson had a large tea to start its program. This was an excellent way to publicize the Nurses' Loan Project, and showed results.

Mrs. Carlos C. Craig,
Nurses' Loan Chairman
Phoenix, Arizona.

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IF YOU CHANGE YOUR ADDRESS

Your copy of Arizona Medicine is addressed to you several months in advance of the publication date; so if you change your address, please notify us at least three weeks in advance.

Send your old address together with the new, preferably clipping the name and address from your last copy of Arizona Medicine.

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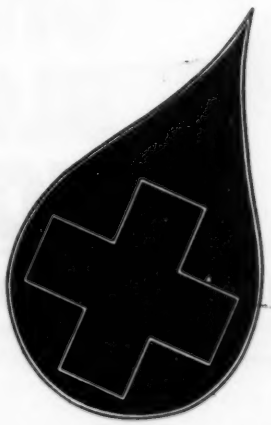

Woman's AUXILIARY

OUTLINE OF THE NURSES' LOAN PROJECT

I. The Nurses' Loan Fund was established in 1950.

II. The fund was about $600.00.
   a. The money was derived from:
      Contributions from members at large.
      One dollar per member from four county auxiliaries.
      Sixty dollars from interested members in Phoenix and other board members.
   b. In 1951 Maricopa County Auxiliary gave $300.00 to the fund because of its keen interest in the project.
   c. The Woman's Auxiliary to the Arizona Medical Association has most generously augmented the fund each year in order to help insure the success of the project and to help more applicants. Each member of the State and County Auxiliaries will have paid $5.00 toward the fund over a five year period. All members at large who have not contributed are urged to do so. Send your checks to the State Treasurer, Mrs. R. Lee Foster, 2215 North 11th Avenue, Phoenix, Arizona.
   d. In the three years since its appointment, the Committee has loaned $2450.00 to eleven young women to go through nurses training.

III. Requirements:
   a. B average in high school.
   b. Good moral character.
      Three references are required.
   c. Must show proof of needing financial assistance.
   d. Must pass a strict physical examination.
   e. Must be accepted by one of the four accredited schools of nursing in Arizona. These hospitals are:
      Good Samaritan, Phoenix, Arizona
      St. Joseph's Hospital, Phoenix, Arizona
      Memorial Hospital, Phoenix, Arizona
      St. Mary's Hospital, Tucson, Arizona
   f. Must have a personal interview with a member of the committee.

IV. Repayment of the Loan.
   a. The Loan requested must not exceed $300.00, is interest free. Repayment of the loan must start six months after the girl receives her state license to work at the rate of not less than $12.50 a month.
   b. If the girl does not finish her training she must start repayment within 30 days after leaving school. She must repay the loan at not less than $12.50 a month.
   c. Applications who receive the loans are required to sign contracts with the Auxiliary. A parent, or guardian, is also required to co-sign with the girl to repay the loan.

V. Where the girls who have received loans are now.
   a. Only one girl has graduated since the fund was established. She is living in Pennsylvania and has repaid $60.00 of the $100.00 loan.
   b. St. Mary's Hospital in Tucson
      One senior.
      One freshman in the September Class of 1952.
   c. Good Samaritan Hospital, Phoenix.
      One girl who is a senior and who has a brilliant record.
      Two freshmen students, September class of 1952.
   d. St. Joseph's Hospital, Phoenix.
      One senior girl.
      Three young women in their second year.
      One freshman girl who entered in September class of 1952.
   e. Families of the girls who have received loans live in Kingman, Morenci, Clifton, Globe, Tucson, Prescott, and Phoenix.

VI. How Committee gets applicants.
   a. Each January a letter is sent to all high school principals in Arizona telling of the availability of the loan and listing the qualifications. Two duplicate letters are enclosed, one for the school

nurse or vocational director and one for the bulletin board.

b. Last year an appeal was made through Arizona Medicine to all doctor's wives to help inform their communities of the project.

c. Last year most county auxiliaries had a Nurse Recruitment Week to inform the public of the great need for more trained nurses, and to interest high school girls in going through nurses' training. With the cooperation of the hospitals who arranged lectures, tours, and even luncheons for these girls the project was most successful. Tucson had a large tea to start its program. This was an excellent way to publicize the Nurses' Loan Project, and showed results.

Mrs. Carlos C. Craig,
Nurses' Loan Chairman
Phoenix, Arizona.

———O———

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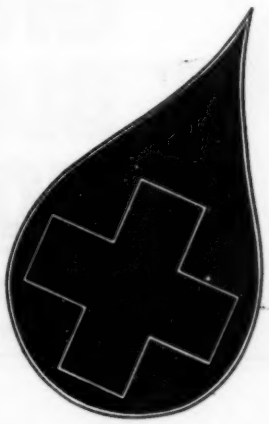

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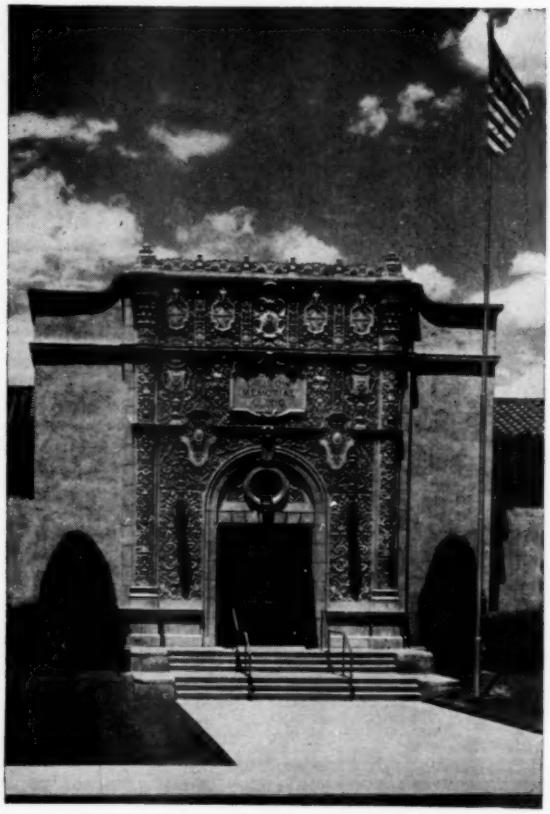

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